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AUTHOR Emrick, John A.; Peterson, Susan M.
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ABSTRACT

Reviewing five large-scale investigations of educational dissemination and change, this report synthesizes and consolidates their findings and implications around an issue of common interest to policymakers, program administrators, and researchers: what can be learned from these studies about processes and procedures that facilitate knowledge diffusion and utilization in schools? Each of the five studies--"The Use of Educational Knowledge: Evaluation of the Pilot State Dissemination Program," "Federal Programs Supporting Educational Change," "Evaluation of the Field Test of Project Information Packages," "Evaluation of the National Diffusion Network," "Assistance Strategies of Six Groups That Facilitate Educational Change at the School/Community Level"--was national in scope, investigated one or more relatively distinct dissemination strategies, involved in-depth case study components, and used on-site observation and data gathering procedures. A brief synopsis of each study provides its dominant goal or mission and strategies, its prevailing dissemination and change assumptions, the essential features of its methodology, and its primary findings and interpretations. Generalizations derived from the cross-study synthesis are given, and further considerations for which evidence is inconclusive or contradictory are discussed. In addition, a number of guidelines for effective dissemination/utilization are suggested. Concluding the report is a glossary of technical terms used. (Author)

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A SYNTHESIS OF FINDINGS ACROSS FIVE RECENT STUDIES IN EDUCATIONAL DISSEMINATION AND CHANGE

(Revised Version)

John A. Emrick with Susan M. Peterson

John A. Emrick and Associates
Los Altos, California

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FAR WEST LABORATORY
FOR EDUCATIONAL RESEARCH AND DEVELOPMENT
1855 FOLSOM STREET • SAN FRANCISCO, CALIFORNIA 94103 • (415) 565-3000

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FOREWORD

This Occasional Paper Series is the result of a collaborative effort among the National Institute of Education, the Far West Laboratory for Educational Research and Development, and students and practitioners of educational dissemination. Each of the papers in the series will be related to the dissemination and utilization of educational information and will reflect the continuing interest and activities of both NIE and Far West Laboratory in this area of educational research and practice. In some instances, the paper will be prepared by Far West Laboratory research staff; in others, the Laboratory will commission papers by practitioners and scholars in the field. Many of the papers will provide the basis for, or will be the result of, a series of dissemination conferences involving educational dissemination sponsors, dissemination project managers and staff, school practitioners and scholars concerned with educational improvement.

The major goal of the series is to define areas of agreement and disagreement within the research, development, and practice communities on those factors which are most important in supporting the process of educational improvement. Among the factors to be considered are activities of staff involved in dissemination, the organization and operation of dissemination programs, and the organization and operation of school systems. The papers also will examine basic aspects of dissemination such as the spread and exchange of information, the use of information in program planning, and the provision of training and consultation to help implement program improvements.

One of NIE's goals is to help build support services for schools and school systems which are attempting to improve educational practice. The papers in this series are particularly related to two of the many Institute efforts directed toward this goal: the interpretation of research for practitioners and the training and support of linking agents.

The papers and the processes used in their preparation are related to the NIE knowledge analysis and interpretation project which encourages the analysis, synthesis, and interpretation of research findings for application in educational practice. Although there is no consensus on how this process of analysis/synthesis/interpretation should be carried out, we assume that it is not solely an intellectual process but includes an emphasis on agreement among persons with different personal and organizational commitments.

In addition, we expect the papers to contribute to the conceptual base for the NIE-funded Linkage Support Service, which is intended to collect, organize, and convey information about linker training materials and human resources to those involved in linkage programs. We expect the consultation and training experience of the Linkage Support Service to keep the papers tied to reality, and we expect the ideas in the papers to help in describing and making sense of the experience of linking agents and agencies.

The papers are the continuation of an interpretation activity which began in June 1975 with Philip Piele's review of the literature on linking functions and linker training. That review and the resulting discussions highlighted a number of problems in the available literature: (a) linking tends to be equated with change and with adoption of innovations rather than with support to program improvement efforts; (b) the important system variables which influence change and improvement in schools are not seen as related to the functions of linking agents; (c) the role of the school administrator in the linking process is often ignored; (d) the functions of information provision, technical assistance provision, and helping the school system build its capacity to assess and improve education are usually seen as external, separate, and unintegrated roles with no attention to their interrelationships with school district curriculum specialists, evaluators, and staff development resource persons; (e) there is little attention to the nature and quality of the information to be conveyed to practitioners; and (f) there is relatively little research on the functions of the linking agents.

Based on that review, it appeared that an understanding of the educational improvement process required attention to the impact of the school administrator and the school as an organization as well as to the role of the linking agent. Subsequent activities have attempted to take such a balanced perspective. In 1977, the University Council for Educational Administration published a set of papers entitled Linking Processes in Educational Improvement. That book drew upon research and experience to look more carefully at processes of educational improvement from the perspectives of the types of knowledge available, the functions of the linking agent, and the functions of the administrator.

The current Occasional Paper Series is a further effort to identify and understand the ways in which different organizations and people relate in the complex process of encouraging educational improvement. These papers are expected to examine the most recent research and experience in order to provide an overview of findings and interpretations which address critical issues and problems in educational dissemination. In conducting such examinations and providing such overviews, we are sensitive to competing needs: to simplify a very complex field, and to avoid over-simplification which is neither a useful representation of reality nor an accurate representation of the variety of perspectives of the dissemination and change process. In turn, the reader should be aware that these papers are not presented as a final statement on any of the issues addressed; neither does any one paper address the full range of issues, problems, or perspectives that can be identified. Rather, the papers are presented as an effort to provide continuing analysis, synthesis, and interpretation of research findings and experience which can move us closer to an understanding of the crucial and complex problems of supporting individuals and organizations in their efforts to improve educational practice.

Spencer A. Ward

Consumer Information Branch
School Practice and Service Division
Dissemination Resources Group
National Institute of Education

Washington, D.C.
June 1978

PREFACE

This analysis and synthesis of five recent studies of educational dissemination and utilization was prepared as part of Far West Laboratory's continuing Educational Dissemination Systems Support Program sponsored by the National Institute of Education. This particular effort represents the culmination of a collaborative process involving the synthesis authors, the principal investigators of the studies being synthesized, members of the Laboratory staff, NIE, and a panel of distinguished experts in educational dissemination and utilization. This interactive process was used to shape the content and focus of the present document, as well as the revision of the drafts which preceded it.

The report is primarily oriented to practitioners in the field of dissemination and utilization of educational knowledge and change. This audience includes both change agents and administrators/managers of change agent programs. We also have attempted to address a number of research and policy concerns. As such, the report focuses on two major objectives:

1. to provide the field an accurate and comprehensive summarization of issues and findings from a set of recent important studies of educational dissemination and change; and

2. to organize these findings across studies into a synthesis which might serve to advance practice, policy, and research in improvement-oriented change.

To accomplish these objectives, we adopted a two-level collaborative review procedure. The first level pertained to the summarization of the five studies and involved the active participation of the principal investigators of the studies. Drs. Sam Sieber and Karen Louis (the evaluation of the Pilot State Dissemination Program); Drs. Paul Berman and Milbrey McLaughlin (the study of Federal Programs Supporting Educational Change); Dr. Marian Stearns (the evaluation of the Field Test of Project Information Packages); Dr. John Emrick and Susan Peterson (the evaluation of the National Diffusion Network), and Dr. Donald Moore (the study of six Technical Assistance Groups). Early drafts of the individual study summaries were reviewed and critiqued by their respective investigators, and revisions were specified according to a mutually agreed-upon format. The goal was to attain uniform presentation, involving factual accuracy and comprehensives, of each study, incorporating more recent interpretations and insights where relevant. The synopsis section of the present report has, in the judgment of the reviewers, attained this goal.

The second level of review pertained to analyses and syntheses of findings performed by the authors of this document. Whereas the first (synopsis) level of review afforded reviewers editorial control, for this second level they served as advisors and critics to the synthesis authors. The generalizations, guidelines, and conclusions, while reflecting general consensus, are those of the synthesis authors, Emrick and Peterson. However, the

authors wish to acknowledge the insights and assistance provided in the Far West Laboratory review and critique discussions, which in addition to the principal investigators of the five studies included Drs. David Clark, Gene Hall, Henry Brickell, and Spencer Ward, as well as the staff of the Laboratory.

A further point of clarification about the nature of the five studies, and the resultant synthesis, is appropriate. Program or practice improvement and dissemination itself are often thought to be synonymous with improved student performance on standardized tests. Although the ultimate goal of dissemination and of the programs and strategies examined in the five studies is indeed improved student learning, only one of the studies (Stearns, Evaluation of the Field Test of Project Information Packages) gathered data on student test performance. Rather, the focus of the studies was on the strategies used to disseminate improvement-oriented programs or practices. Thus, they are primarily studies of the process of dissemination rather than its ultimate impact, and effectiveness and success are considered in terms such as adoption, implementation, incorporation, and institutionalization of programs or practices. This distinction serves as a reminder of the many steps between the first stage of dissemination--spread--and achievement of the ultimate goal--improved student performance. These five studies and the synthesis report provide some important insights into the current state of knowledge about some of the steps required to reach that goal.

Paul D. Hood

Carolyn S. Cates

John A. Emrick

Susan M. Peterson

ABSTRACT

The purpose of this synthesis was to review the findings of recently completed large-scale investigations of educational dissemination and change in order to consolidate findings and implications around an issue of common interest to policymakers, program administrators, and researchers: What can be learned from these studies about processes and procedures that facilitate knowledge diffusion and utilization in schools? Five studies were included in the synthesis:

- PSDP: Sieber, S. D., Louis, K. S., and Metzger, L. The Use of Educational Knowledge: Evaluation of the Pilot State Dissemination Program (two volumes). New York, NY: Columbia University, Bureau of Applied Social Research, 1972 (ED 065 739; ED 065 740).

- FPSEC: Berman, P., McLaughlin, M. W., et al. Federal Programs Supporting Educational Change (eight volumes). Santa Monica, CA: Rand Corporation, 1975 (Volumes 1-5); 1977 (Volumes 6-8).

- PIP: Stearns, M. S., et al. Evaluation of the Field Test of Project Information Packages (five volumes). Menlo Park, CA: Stanford Research Institute and RMC Research Corporation, 1975 and 1977.

- NDN: Emrick, J. A., with Peterson, S. M., and Agarwala-Rogers, R. Evaluation of the National Diffusion Network (two volumes). Menlo Park, CA: Stanford Research Institute, 1977 (ED 147 327 and ED 147 340).

- TAG: Moore, D. R., et al. Assistance Strategies of Six Groups that Facilitate Educational Change at the School/Community Level (three volumes). Chicago, IL: Center for New Schools, 1977.

Each study was national in scope, investigated one or more relatively distinct dissemination strategies, involved in-depth case study components, and made use of on-site observation and data gathering procedures. A brief synopsis of each study was prepared in a common format and level of discourse to provide essential study facts relevant to the synthesis: the dominant goal or mission and strategies of the program being studied, the prevailing dissemination and change assumptions underlying the program, the essential features of the methodology used to investigate the program, the primary findings and interpretations developed by the study.

Five major generalizations were derived from the cross-study synthesis:

- Meaningful change occurs as a process, not as an event.

- Directed personal intervention is by far the most potent technical support resource and may be a necessary condition for many forms of utilization.

- Continuous personal participation of the implementing staff is needed to firmly root and sustain the utilization.

- Administrators occupy a crucial role in supporting the utilization process.

- Descriptive, instructional, and support materials are needed, particularly for utilizations including organizational or instructional changes.

General further considerations for which evidence is inconclusive or contradictory are discussed briefly. In addition, a number of guidelines for effective dissemination/utilization are suggested. The report concludes with a glossary of technical terms used in the synopsis and synthesis sections.

Carolyn S. Cates
June 1978

I. INTRODUCTION

Whereas the 1960s can be characterized as a period of intensive efforts to research and develop ways of improving educational practices and procedures, in the 1970s concern has broadened to include issues of how to improve the flow of knowledge and the transfer of technology to local schools. This report represents an effort to review, consolidate, and synthesize findings across a sample of significant recent investigations of educational dissemination and change in American schools.

The goal of this synthesis is to review the evidence from a selected set of recent large-scale investigations of educational change, and from these studies to derive a set of conclusions regarding the current state-of-knowledge and understanding of this phenomenon. We have assumed that our primary audience would be those involved in research on the improvement of education, those involved in designing and carrying out programs to assist in the spread of such knowledge and improvement-oriented change, and those who make policy or allocate resources to facilitate this knowledge production/utilization process.

The five studies included in this synthesis are:

- PSDP: Sieber, S. D., Louis, K. S., and Metzger, L. The Use of Educational Knowledge: Evaluation of the Pilot State Dissemination Program (two volumes). New York, NY: Columbia University, Bureau of Applied Social Research, 1972 (ED 065 739; ED 065 740).

- FPSEC: Berman, P., McLaughlin, M. W., et al. Federal Programs Supporting Educational Change (eight volumes). Santa Monica, CA: Rand Corporation, 1975 (Volumes 1-5); 1977 (Volumes 6-8).

- PIP: Stearns, M. S., et al. Evaluation of the Field Test of Project Information Packages (five volumes). Menlo Park, CA: Stanford Research Institute and RMC Research Corporation, 1975 and 1977.

- NDN: Emrick, J. A., with Peterson, S. M., and Agarwala-Rogers, R. Evaluation of the National Diffusion Network (two volumes). Menlo Park, CA: Stanford Research Institute, 1977 (ED 147 327 and ED 147 340).

- TAG: Moore, D. R., et al. Assistance Strategies of Six Groups that Facilitate Educational Change at the School/Community Level (three volumes). Chicago, IL: Center for New Schools, 1977.

These studies were selected on the basis of scope, relevance, methodology, and availability. That is, each of the studies was national in scope, each investigated one or more relatively distinct dissemination strategies, each involved in-depth case study components focusing on process-outcome relationships and made use of on-site observation and data gathering procedures, and each had final reports and appendix materials available for review and synthesis.

We have attempted to consolidate findings and implications around a common issue of interest to policymakers, program administrators, and researchers, namely: What can be learned from these studies regarding processes and procedures that facilitate knowledge diffusion and utilization in schools? We recognize that several other large-scale investigations relevant to this issue are currently underway.* Still, we argue that the major findings from the collection of studies listed above provide

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* Relevant studies still in progress and thus unavailable for inclusion in this synthesis include the Evaluation of Project Information Package Dissemination and Implementation (AIR/RMC), the Evaluation of the Bilingual PIPs (RMC), the Documentation and Technical Assistance Project (CNS/CEPM), the State Capacity Building Project Evaluation (NTS), and the R&D Utilization Study (Abt).

sufficiently detailed and cohesive evidence to support a number of generalizations which we have derived through our synthesis procedure.

Assumptions and Procedures. In carrying out this synthesis we have made several assumptions that have led to the organization and content of the present report:

a. We have approached utilization and change as the implementation of practices or procedures in response to the dissemination of new knowledge. Thus, we do not consider the mere "spread" or "sharing" of information to constitute knowledge utilization (although they may constitute important components in the process). Rather, it is the conditions and transactions which increase the likelihood of improvement-oriented change that constitute the subject of this synthesis.

b. Since the studies included in this synthesis are large and complex, and published reports have tended to be quite lengthy,* we have assumed that few among our audience would have had the time or the opportunity to read thoroughly the complete reports and their appendices. We found that summaries of these reports (when available) varied considerably both in level of discourse and in issue emphasis. Consequently, we have prepared a brief synopsis of each study in a common format and level of discourse to provide readers with essential study facts relevant to this synthesis.

c. The study facts presented in each of these synopses and summarized in Table 3 (pp. 46-49) describe the essential features of the particular program

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* The two-volume PSDP report exceeds 1,200 pages; the eight-volume FPSEC report exceeds 1,000 pages; the five-volume PIP final report exceeds 700 pages; the two-volume NDN report is nearly 500 pages; and the three-volume TAG report exceeds 1,000 pages.

being investigated, the prevailing dissemination and change assumptions underlying the program, the essential features of the study methodology used to investigate (or evaluate) the program, and the primary findings and interpretations developed by the study.

Specifically, for each study, available reports and appendix materials were read and summarized according to the following four major topics:

(1) What was the dominant goal or mission of the dissemination-utilization program being studied, and what were the prevailing strategies for accomplishing this mission?

(2) What were the central assumptions--either explicit or implicit--underlying the mission strategy? That is, how did the dissemination-utilization program frame or define the problem, and what were its assumptions regarding how to effect utilization?

(3) What were the goals, assumptions, and methodologies (scope, design, sample, instrumentation, procedures, analyses) of the study or evaluation of the program?

(4) What were the primary and secondary findings, interpretations, and recommendations advanced by the respective studies?

d. The material presented in the synopses and summarized in Table 3 has been carefully reviewed and validated by the authors of the initial study reports. This procedure was adopted to assure we have properly understood and interpreted essential study facts to be synthesized, and to provide the report authors opportunities to clarify and update their reports in light of further analyses or insights.

e. We have attempted to develop and employ a common set of technical terms and abbreviations in presenting the synopses and syntheses. These terms and abbreviations are defined in the glossary section of this document. These definitions reflect our usage of the terms, although we have attempted to adhere to prevalent definitions and jargon conventions as we understand them.

f. The synthesis generalizations and propositions for further study were derived from careful comparison and contrast of findings across the five studies, taking into consideration the differences in programs and study methodologies. Major generalizations are derived from the convergence of findings across studies, over and above program and methodological differences (i.e., they represent strong-inference synthesis). Associated propositions represent implications derived from the generalizations, but for which evidence is weak or in apparent conflict.

g. Whereas the synopses of the studies have been reviewed and validated regarding content and interpretation by the study authors, we assume full responsibility for the arguments, interpretations, and generalizations set forth in the synthesis section of this document.

The remainder of this report is organized as follows: Chapter II presents the synopses of each of the five synthesis studies in terms of the program description, program assumptions, study methodology, and key findings. A summary of program and study features is compiled and prepared in tabular form at the end of Chapter II (Table 3). Chapter III presents the results of our cross-study synthesis in terms of major generalizations and implications. Five such generalizations are presented and discussed. A number of further considerations for which current evidence is inconclusive or contradictory are also briefly discussed. The chapter concludes with a set of guidelines for effective dissemination/utilization activities, derived primarily from the synthesis findings. Chapter IV recapitulates the report, presenting a general summary of the five studies, our synthesis of findings, and the implications derived. Chapter IV is followed by a glossary of technical terms used in the synopsis and synthesis sections of the report.

II. SYNOPSES

The Pilot State Dissemination Project (PSDP Study)

Program Description. The Pilot State Dissemination Project (PSDP) was initiated by the Office of Education in 1970. Through this program, federal support was provided to three state education agencies over a two-year period to develop and test strategies for bridging the acknowledged gap between the research and practice sectors of the educational community. This bridging involved the use of field agents supported by an array of informational and personal resources.

The concept of the field agent was borrowed largely from the network of agricultural extension agents who made a considerable contribution to the spread of improved products and practices among farmers. The PSDP's basic objective was to stimulate the spread of research results and other new information into schools in order to foster the development and use of improved practices. To meet this objective, two field agents in each of two states, and three in the third state, were assigned to specific target areas--a school district, county, or region. The target areas included a mix of rural, suburban, and small urban settings. Agents were expected to make contact with school and district personnel and to engage in a variety of activities, such as helping to define local needs and priorities, providing assistance in applying relevant information to these needs, developing solutions, planning for trial or implementation of the solutions, and arranging for appropriate additional assistance.

Although the field agents represented the PSDP's primary interface with potential clients in the target areas, each state-level operation also

included a small team of information retrieval personnel to process client requests and a project director to assume overall leadership and management responsibility. In the target areas, educators could submit requests for information directly to the retrieval facility, but most often the field agents acted as intermediaries in the submission of requests and delivery of materials. In the nontarget areas, educators had only direct access to the information services.

Program Assumptions. What set the PSDP apart from many efforts to promote educational reform in the 1960s was that it did not concentrate on building or upgrading the knowledge base. Instead, the PSDP focused directly on the transmission of knowledge into the practice community. Implicit within the PSDP strategy was the assumption that the ERIC system and other information about educational practices, products, and programs constitute valuable resources for promoting improvement, but that these resources were having little impact on the practice of education because they were underutilized. It was believed that LEA personnel typically lack the motivation and/or skills and knowledge needed to take full advantage of resources like ERIC. The PSDP's basic assumption was that these obstacles could be overcome to a considerable extent through the use of intermediaries or personal linkages between the practitioners and the information base. It was expected that the agents' activities would make the information more accessible to practitioners and thus would increase the impact of research and development upon the practice of education.

Study Methodology. Concurrent with the operation of the pilot program, USOE contracted with Columbia University's Bureau of Applied Social Research to conduct a comprehensive evaluation. The approach taken was described in

the evaluation's final report (Sieber, Louis, and Metzger, 1972) as a process evaluation used to address both formative and summative goals. Field observers assigned to each project spent over a year observing the activities of the agents and retrieval personnel; their work produced a series of case studies and formed the basis of the evaluation report's discussion of project operations in each state. In addition to the extensive qualitative data provided by the field observers several structured instruments were used to gather more quantitative information. These included: (1) a goals checklist administered to all project staff; (2) a self-report questionnaire mailed to a sample of clients; and (3) information retrieval forms.* Data from these structured instruments were used in the assessment of project impacts and in statistical analyses of process-outcome relationships.

Key Findings. The PSDP evaluation concluded that the agents were successful in reaching client groups traditionally unlikely to seek information and assistance from outside sources. During a five-month period in the program's second year, requests for information were received from an average of 8.6 percent of the educational personnel in the districts served by agents; during the same period, only about .005 percent of the LEA personnel from nontarget areas requested information. Agents were particularly successful in stimulating requests from classroom teachers, a group traditionally found to be unlikely to use ERIC or other similar resources.

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* Questionnaires were mailed to all clients served by the pilot projects during a five-month period in the second year of operations. The questionnaires covered such topics as the type of information and assistance received, the client's assessment of the information and services, and his/her expected future use of the system. For each such request, an information retrieval form was also completed, indicating the type of search conducted (computer, manual, or both) and the nature of materials provided.

Although the study's major focus was the stimulation of information-seeking behavior among LEA personnel, the impact of information and assistance provided to clients was also addressed, primarily through the client survey. The PSDP study concluded that field agents' clients found the information and assistance they received more valuable than did clients not served by agents, and that agents' clients were more likely to make actual use of the new ideas and knowledge.* Further, the study reported considerable sharing of information and materials (secondary diffusion or "ripple effects"). Clients who reported receiving personal assistance (from an agent, a subject matter specialist, or both) to supplement printed materials were more likely to make use of the information than were clients who received only materials.

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* In later reanalyses of utilization data, Louis and Sieber (forthcoming) classify respondents into four groups with respect to use of the information received; implementer (actual use), planner (intent to use), absorber (material has been read) and non-user (material has not been read or has been read and rejected). The percentages falling into each group, by targeted areas and non-targeted areas, are:

	Field Agent Areas	Non-Field Agent Areas
Implementer	22%	13%
Planner	19	22
Absorber	37	47
Non-user	22	19

The higher percentage of implementers in areas served by field agents was considered particularly significant because agents' clients were more likely to come from lower levels in the district hierarchy than were users in the non-targeted areas. Also, the users in non-targeted areas acted on their own initiative in requesting information, since they were not served by field agents.

Several features of the field agent role were cited as probable causes for their success in gaining acceptance for themselves and the services they offered. As generalists the agents could present themselves to LEA personnel as ready and willing to serve a wide range of interests and priorities identified by the clients themselves. The agents also had the freedom to shift roles from conveyer of information to process helper or leader, depending on circumstances. Formally, as state employees the agents were "outsiders" to the school systems they were expected to influence. At the same time, however, all the agents had recent experience as teachers or administrators in the regions they served, which made them familiar with local norms and customs and probably added to their credibility as sources of assistance to school people.

Third, the agents' lack of power to mandate change was cited as a factor contributing to their success because it made them nonthreatening. The evaluators had anticipated that lack of power would pose major problems in the agents' efforts to gain access to potential clients and to promote change. However, they concluded that the combination of the three factors (generalist, outsider, no power to mandate change) reduced the potential for co-optation of the agents or for rivalry between the agents and local authority figures or specialists and promoted the development of collegial relationships between agents and their clients. Further, although agents lacked formal power, they did make informal use of existing power structures to gain access to school personnel and to help remove organizational obstacles to change.

The field agent role was new to education and not without problems. Gaining access to potential clients proved to be more difficult for the agents than had been expected. While publicity campaigns involving letters

and brochures were found useful for purposes of announcing the services, personal contact, at multiple levels within the target systems, was necessary to create interest. An initial call upon the superintendent was needed to secure administrative concurrence for the agent's presence, and subsequent informal contacts with individuals or small groups were essential to stimulating interest and requests for assistance.

The most difficult issue for the agents was determining the appropriate level of involvement and directiveness in local activities. The issue arose primarily in two spheres: identification and diagnosis of client needs, and provision of follow-up assistance to supplement written materials and facilitate local change efforts. In both cases, agents typically adopted a low profile posture. Although agents developed some needs assessment and diagnostic skills, they tended not to engage in extensive diagnosis except when clients asked for such help.

The level and nature of follow-up assistance and agent involvement in local implementation efforts was especially problematic. Although the need for follow-up varied according to several considerations, the investigators concluded that some follow-up contact, initiated by the agent, was almost always necessary to sustain client interest and effort. The evaluators discovered a general tendency toward underinvolvement of field agents in follow-up, particularly in connection with local efforts to implement new practices.

Provision of training for staff in the three state projects was the responsibility of an external contractor. Both centralized and decentralized approaches to training were attempted during the two-year period under study, and a variety of topics and skill areas were addressed. Although field agents reported substantial improvement over time in the relevance and quality of training provided to them, they identified a number of unmet needs at the

end of the two years. For the most part the agents believed that the most critical skills for carrying out their job were gained through actual experience working with clients rather than through formal training.

The PSDP study also examined the information retrieval components of the three PSDP operations. The report provides a discussion of problems and issues related to setting up and operating retrieval capabilities, including computer-related problems, nature and format of materials provided to clients (prepackaged materials vs. customized searches, hard copy vs. microfiche), recordkeeping, and staffing requirements. More than 900 information requests were classified according to the nature of information requested. The majority of requests dealt with instructional methods and curriculum or with specific subject areas. The evaluators concluded that school personnel are less interested in research on the foundations of learning (e.g., how individual differences affect learning) than in innovations developed for use in the classroom and "how-to-do-it" materials.

Organizational issues were another major focus of the PSDP study. The three pilot projects were newly established units housed within state education agencies. Specific goals and role definitions were initially unclear, and the organizations underwent considerable evolutionary change during the two years of the study. The investigations attributed many of the problems experienced by the evolving projects to a combination of two factors: lack of a well-developed model* and organizational dispersion.

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* Sieber et al. cited several key distinctions between the role of the educational field agent and the agricultural extension agent model.

During the early months of operations, separation of the field staff from other project personnel created internal communication problems and caused a sense of isolation among the field agents, who received relatively little substantive guidance or moral support. However, the very factors which led to organizational problems also had positive consequences. The advantages of the dispersed organization are a primary focus of a Louis and Sieber (forthcoming) publication on the PSDP. In particular, dispersion placed the field agents close to the clients and permitted the agents a considerable amount of autonomy. Louis and Sieber attribute the agents' success in stimulating information-seeking behavior among their clientele in large part to their translation of this autonomy into flexibility and responsiveness to client interests and priorities.* In this sense, dispersion helped to foster development of the pilot projects in adaptive directions.

Federal Programs Supporting Educational Change (The FPSEC Study)

Program Description. In July 1973, the U. S. Office of Education contracted with the Rand Corporation to undertake a multiyear study of several federally supported programs designed to promote improvement-oriented change in schools. The four programs studied were ESEA, Title III; ESEA, Title VII; Vocational Education, 1968 Amendments, Part D; and Right-to-Read. The study

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* This is not to rule out such other factors as user characteristics as influences on the information-seeking and utilization behavior of the field agents' clients. Louis has examined some of these factors in reanalysis of the PSDP data, 1977.

was intended to provide insight into how the process of innovation operates and what factors influence the process and its outcomes.

Of the four programs studied, ESEA Title III was the largest in terms of funding (approximately $150 million annually during the period studied) and the broadest in scope. Its intention was to introduce new practices and projects to schools and districts on a demonstration basis. The competition for three-year grants resulted in support for a wide array of locally developed projects. The other three programs were more specific in the range of subject matter addressed and in criteria for funding. Right-to-Read ($12 million annually) was designed to create a national priority on reading, particularly among disadvantaged students; the FPSEC study examined Right-to-Read demonstration projects required to follow a prescribed planning and management strategy. The focus of Vocational Education, Part D ($16 million per year) was on enhancing career awareness and readiness. Finally, ESEA Title VII ($45-$85 million per year) provided support for bilingual education projects for children of limited English-speaking ability.

Program Assumptions. The four programs included in the FPSEC study shared the goal of stimulating the development and spread of educational innovations within local settings. They also shared the assumption that one means of promoting improvement-oriented change in schools is through provision of federal "seed money" to school systems. While the grants were small compared to overall district budgets, it was assumed that they would allow LEAs to install new projects and practices that they probably could not undertake without special funds. It was further assumed that such external support would be needed only for a limited period, while LEA personnel put new practices into operation and evaluated their effectiveness.

After this limited period (e.g., three years in the case of ESEA Title III), it was expected that most LEAs would discontinue projects found ineffective and continue successful ones with district funds.

Although three of the four programs were identified with particular subject areas and/or target groups, none was restricted to disseminating and promoting utilization of specific instructional practices or curriculum materials. Development of improved approaches for teaching reading, enhancing career awareness, or meeting the needs of children with limited skills in English was left largely to the LEA personnel. Federal involvement was for the most part limited to the provision of grants to LEAs (portions of the ESEA Title III and Vocational Education funds went through state education agencies, but the grants were ultimately targeted for LEA use) and general guidelines. As such, the FPSEC study provided an opportunity to examine the efficacy of federal "seed money" as a strategy for promoting change.

Study Methodology. The FPSEC study was guided by a three-stage model of the change process, which differentiates among initiation (planning and mobilization of resources), implementation (putting new practices into actual operation), and incorporation (stabilization of the new practices and assimilation into regular school operations). Further, the investigators assumed that federal policies and dissemination strategies should attend to all three stages. Finally, mutual adaptation--a process by which a new program and the individuals and organizations involved in its use change over time to become more compatible--was assumed to be critical.

The study was conducted in two phases, with Phase I examining local projects during their last or next to last year of federal support and focusing on initiation and implementation issues. Phase II examined the

fate of the projects following the withdrawal of federal funds. Phase I data collection included a (personal interview) survey of teachers, principals, and administrators at 293 sites and interview/observation studies of 29 sites drawn from the survey sample. The in-depth studies formed the basis of the study's description of the process of innovation (see Volume III). Regression analyses of the survey data were used to assess implementation outcomes and to identify factors influencing variations in these outcomes (see Volume II). In Phase II, the study was focused on ESEA Title III (which became Title IV-C) and Title VII projects; a sample of each was selected for return visits.

Key Findings. The study of the four federal programs concluded that the seed money strategy produced a major impact in terms of stimulating LEAs to undertake projects that were consistent with program guidelines but that would have been difficult to attempt without special funding. Initiation of new projects did not, however, guarantee successful implementation, and implementation success did not by itself assure long-term continuation. Districts were found to differ markedly in their receptivity to change and their capacity to manage change, and these local factors profoundly influenced processes and outcomes in all three stages.

Phase I research indicated that what distinguished successful from unsuccessful implementation was not differences across the emphases, policies, funding levels, or management strategies of the four federal programs; instead, the dominant factors were found to exist at the local level:

- the LEA's motivation for initiation;
- the nature and scope of change attempted;
- the implementation strategy taken;
- characteristics of teacher participants; and
- the level of institutional support provided.

The investigators found two essentially different motivations for initiation in the sites studied: opportunism and problem-solving. Basically, in the problem-solving model, projects were initiated in response to locally recognized, high-priority needs for which an apparently feasible and acceptable solution was available. In other districts, however, the "needs" were defined primarily as a response to the guidelines that accompanied the federal dollars. In these "opportunistic" districts, local recognition of the stated needs and commitment to the projects was found to be low or nonexistent. The importance of initial motivation became evident in subsequent stages.* When district-level recognition of need and commitment to project goals were not present during initiation, they generally failed to emerge later. As a result, projects initiated for opportunistic reasons produced little or no impact in terms of changed instructional behaviors and practices, and they almost never survived the withdrawal of federal support.

While the FPSEC study found little apparent connection between outcomes and variations in treatment or resource level (size of grant), the scope of change proposed was found to be important. Berman (1977) has phrased the relationship succinctly, as "little ventured, nothing gained." Projects that did not require significant change in teachers' behavior induced little change. Projects that did attempt to influence teacher behaviors (rather than, say, merely to provide some new materials) were viewed by teachers as opportunities

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* Since Phase I data collection was carried out near the end of the federal support period, initial motivation could be addressed only retrospectively. It is possible that some reports of early endorsement or opposition to projects were influenced by the level of success and acceptance they subsequently attained. The study team attempted to minimize the effect of such bias by obtaining multiple perspectives on how projects were initiated.

for professional growth, and this perception operated as a powerful incentive for the extra effort and change required of the teachers. Projects that were structurally complex (i.e., that involved large numbers of personnel, classrooms, and schools), on the other hand, encountered major problems of coordination that reduced the likelihood of success. Gradual approaches that began with a small number of classrooms were more successful than ones attempting to introduce change throughout an entire district simultaneously.

Implementation processes and strategies were a major focus of the study. Implementation strategy basically pertains to means used by local project leaders to guide and support the implementation process. Two projects designed to use virtually the same instructional methods might be characterized by widely differing implementation strategies and vice versa. In general the most successfully implemented projects were characterized by strategies that promoted mutual adaptation; important components of these strategies included:

- staff training focused on practical aspects of project operations.
- high levels of support activities for participants (e.g., visits to demonstration classrooms; observation of implementation efforts and feedback from project leaders or consultants).
- frequent meetings of project staff.
- staff involvement in decisions affecting project operations.
- development of materials by local participants.
- inclusion of highly motivated staff who volunteered to participate and, in some cases, were selected by project leaders as "most likely to succeed."
- targeting of change efforts to elementary schools.
- involvement of a "critical mass" of participants.

Characteristics of participating teachers were also critical. Most important was the teachers' sense of efficacy. The FPSEC study found strong

positive relationships between a teacher's belief that he/she could help even the most difficult or unmotivated students and outcome measures. On the other hand, length of teaching experience had a negative effect on outcomes; teachers with many years of experience were less likely to change their behaviors or be involved in projects that attained their goals or improved student performance.

In Phase I, the FPSEC investigators concluded that local receptivity to the innovation being attempted was critical; few projects were able to survive in a hostile or indifferent environment. Administrative support, at both the district and school levels, was one important element of the institutional climate. At the district level, endorsement of the project by the central office was usually sufficient to allow implementation efforts to proceed, but a more active type of support on the part of principals was generally necessary for success.

Effective local leadership was another important component of the organizational climate. Phase I research pointed to the critical need for local leaders with skills in the content area(s) covered by the innovations and with the organizational and interpersonal skills needed to work well with teachers, principals, and district-level personnel. Phase II confirmed the importance of such skills.

The focus of Phase II research was on continuation of the projects after withdrawal of federal support. Here the investigators found little evidence to support the assumptions underlying the seed money strategy. First, decisions regarding continuation were almost never based primarily on evaluation results. Second, few projects were continued intact. Most of those that were continued underwent further modification to fit within district budgets. Third, a district-level decision to continue a project did not guarantee that the project would become fully institutionalized and survive over the long term.

The investigators characterized continuation as occurring at two levels: the classroom and the district. The factors influencing the two levels were different, and each could (and often did) occur independent of the other. Teachers were most likely to continue using techniques and materials that they felt comfortable with and that they believed had contributed in some significant way to their professional growth. District-level decisions were dependent on a number of considerations, including the apparent success of implementation efforts, centrality of the project in terms of district priorities, staff and community acceptance of the project, and, most importantly, support from principals of participating schools.

What appeared necessary for full institutionalization (defined in the FPSEC study as integration of project-related change into the school system as a standard or characteristic feature of district operations) was a combination of continuation at the classroom level with provision at the district level of the support systems needed to sustain (and possibly expand) the changes brought about by the project. Unfortunately, instances of full institutionalization were very few in number, occurring only in those infrequent cases where local leadership had recognized from the outset the full implications of "soft" money and had begun planning for continuation almost immediately. For most of the projects classified as "continued," such planning, when it occurred, began late in the implementation stage. Utilizations were continued as "special projects" on a temporary basis (often with some reduction in scope), and their value to the district had to be reestablished with each new budget cycle. Thus, the future of such utilizations remained highly uncertain.

Evaluation of the Field Project Information Packages (The PIP Study)

Program Descriptions. In 1974, USOE awarded 19 grants under ESEA, Title III, Section 306, to LEAs to participate in a two-year field test of six Project Information Packages (PIPs). These packages were designed to provide LEA personnel with the information needed to install and operate effective approaches to compensatory education in reading and mathematics. Each package was based on a project developed in a local school setting (in five cases with Title I funding) and validated by the Education Division's Joint Dissemination Review Panel. USOE had earlier sponsored the search for these exemplary projects and the project packaging effort by RMC Research Corporation (Tallmadge, 1974).

The actual project packages developed for the field test consisted of nine differentiated information components.* These components, their staff targets, information purposes, and contents are summarized in Table 1.

Program Assumptions. The concepts and assumptions underlying this dissemination-via-packaged-information effort are described in the final report on the SRI evaluation of the field test. The fundamental concepts are:

- Program replication. It was assumed that the "essential features" of a successful program (i.e., those that made it successful) can be reproduced in new sites. Implementation of these essential features will lead to replication of positive impacts on student participants.

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* The RMC PIP model differentiated between stages as well as types of information for appropriate replications. First-stage materials consisted of an Analysis and Selection Kit (ASK). ASK materials provided brief descriptions of each PIP, their adoption and implementation requirements, and a set of criteria by which the potential adopter can assess a given PIP's suitability to local needs and conditions. However, the ASK component was not included in the first field test, and thus was not part of the evaluation.

TABLE 1

SUMMARY OF PIP COMPONENTS

Component	Personnel/Purpose	Contents
Installation (start-up) stage		
1. Starter set: planning	For project director: Provides orientation to project Provides public relations materials on project and package Provides introduction to package (and director's role in project) For school boards, principals, regular school staff, potential project staff, parents: Provides information to elicit support	Filmstrip with cassette tape Handout brochure Project director's orientation booklet (with cassette tape for some projects) Viewfoils
2. Project management directory	For project management personnel (project director, assistant director, principal, as applicable): Provides detailed guidelines and support materials needed to plan and implement (operate) the project	Project management calendar Supplementary sections on the major management tasks
3. Project management displays	For project director and visitors: Provides time schedule overview Summarizes component use Displays component use and time schedule to visitors	Major management tasks chart PIP use displays
4. Staff qualifications and preparation set	For director: Provides personnel selection guidelines For staff: Provides self-evaluation and orientation materials	Staff qualifications checklist In-service training topics
Implementation stage		
5. Starter set implementation	For project classroom personnel: Helps in starting each type of activity (testing, teaching, other) including setting up environment for the first time	Implementation starter booklet Original art file
6. Classroom management directory	For project classroom personnel: Provides guidelines for classroom procedures Provides samples of materials needed for administration of the project, record forms, letters and notices, and the like	Teaching staff guide (e.g., a calendar and support materials)
7. Student relationships album	For project staff interacting with children: Describes the project environment, from the child's viewpoint, that staff is expected to create (e.g., how he should perceive staff; what learning climate he should experience--high pressure, self-directed, and so on) Distinguishes roles of different staff members in creating environment Describes desired student responses (e.g., confident, competent, happy, eager) and gives specific instances	Album
8. Professional relationships guide	For all project staff (plus principal): Defines roles in relation to all school staff (project and nonproject) with whom each project member interacts Provides descriptions of potential staff conflicts and suggested resolutions	Guide booklet
9. Hardware/software packet	For project director and teaching staff: Aids in selection and ordering of commercial hardware/software Provides description, source, and features of core and supplementary items For teaching staff: Describes experience of original project staff plus modification (if any)	Factsheets and manufacturers' brochures for core items Supplementary materials list with publishers' addresses, available factsheets, and brochures

Source: Piestrup (1974).

- Autonomous package. The essential features of the exemplary projects can be identified and communicated via packaged information. LEAs will need little or no additional assistance to implement the projects.

Additional assumptions underlying the PIP effort included the following:

- LEAs are motivated to adopt PIPs because they desire to discover and use effective programs.
- LEAs are capable of assessing their needs and of selecting a PIP that is suitable for local needs and resources.
- Capable project leaders and staff are present within LEAs and will be attracted to the PIPs. Further, these staff will make a serious attempt to implement the packaged specifications.
- The lengthy "trial-and-error" start-up and implementation process that occurred at the originating sites can be reduced to as few as six months via packaged information.
- The expenses and uncertainties associated with alternative dissemination programs (e.g., those that rely heavily on in-person technical assistance) can be reduced via PIPs. The resulting increase in the likelihood of effecting improvement-oriented change will offset the considerable costs of PIP development.

Study Methodology. USOE contracted with SRI to undertake a comprehensive evaluation of the field test. The focus of the first-year evaluation was on the extent to which personnel in the participating LEAs were willing and able to implement the packaged guidelines. A major portion of the evaluation also focused on the adequacy of the PIPs to effectively communicate essential project details to the personnel in the replicating sites. This portion of the study was performed by RMC Research Corporation, under subcontract to SRI (Horst et al., 1975).

The major focus of the second year was on determining effects on students. Evaluation methodology during both years included repeated visits to the field test sites to interview local personnel and observe project operations. Self-report questionnaires were administered to project staff and a sample of school and district personnel to assess their attitudes, opinions, and impressions

of the projects. Student impacts were assessed via standardized achievement tests and affective measures administered in the fall and spring of the second year.*

Key Findings. The first-year evaluation indicated that most field test site personnel were willing and able (at least under the somewhat artificial conditions imposed by the field test**) to implement the packaged guidelines and to recreate the management features of the original projects fairly well at a mechanical level. Implementations became stronger and more internally consistent in the second year as project staff gained confidence and experience. Interview and questionnaire data showed marked enthusiasm for the new projects on the part of project staff and considerable pride in their accomplishments. Thus, although major revision of the original packages was deemed necessary, they were judged effective as devices for communicating important features of project management.

With regard to re-creation of the originating sites' instructional programs and impacts on student achievement test scores, the evidence was less positive. Five of the six packages did not prescribe specific curricula; as a result, the instructional programs implemented at the field test sites tended to differ both among sites or classrooms using the same package and between field test sites and originating sites. Further, the results of the

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* Samples of students were tested in the first year.

** Field test conditions included both the carrot and the stick. Specifically, LEAs were given fairly substantial grants for the explicit purpose of implementing a PIP; USOE monitoring emphasized fidelity to packaged specifications; and an external evaluator watched the implementation process closely.

second-year evaluation of student impacts indicated that hoped-for achievement gains were not generally realized.*

Given the packages' emphasis on project management and their lack of detail concerning the instructional programs (curriculum, methods, and the like), the evaluators suggested that instructional programs at the adopting sites should not be expected to duplicate the originals. The packages facilitated duplication of conditions for effective instruction (pupil/teacher ratios, time set aside for intensive instruction in basic skills, availability of extensive equipment and materials, etc.) but not replication of the specifics of pupil/teacher interactions and the instructional process. The evaluators concluded that it was probably not reasonable to expect management considerations to exert a strong and direct influence on pupil achievement.

Such analyses, both of PIP materials and replication effects, led to substantial modification of these and subsequent PIPs. For one thing, the emphasis of the descriptive materials shifted decidedly more toward project goals (intended outcomes), with less emphasis on replication of process per se. Secondly, the emphasis on management components was redirected toward goals and functions, as opposed to mere mechanical procedures. Third, PIPs were reconfigured, reformatted, and user-segmented. Thus, in subsequent versions, each project participant had his/her own differentiated set of materials which emphasized relevant components and summarized the rest.

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*Most student participants attained "normally expected" growth (i.e., their percentile ranks did not drop from fall to spring on the Metropolitan Achievement Test). However, most did not attain the more stringent target criterion of one-third standard deviation above the equal percentile-growth expectation that had been established at the outset of the field test.

Although the conditions of the field test did not permit an adequate test of all the assumptions listed above, the field test evaluation did shed serious doubt on the assumption that LEAs would be highly motivated to adopt PIPs in order to replace their own, less effective, compensatory education projects. LEAs participating in the field test used the PIP projects in addition to (and not instead of) ongoing programs; often the new projects were used to reach schools or students not previously involved in compensatory programs because of limited resources.

The evaluators recommended that the concept of a self-contained, stand-alone package be given serious reconsideration. The PIPs were found to be useful communication devices for certain "pullout" programs that call for highly specified resources and easily understood procedures. To the extent that innovations targeted for dissemination required significant organizational or behavioral change on the part of users, however, the PIPs were less effective. The one program that called for use of a combination of highly innovative methods (open classrooms, learning contracts, gaming and simulation) encountered major problems at each site where it was used. Further, it was concluded that the PIPs cannot disseminate themselves; an intermediary is needed to publicize them to LEAs and to generate interest in using a PIP among LEA personnel. Finally, the technical details communicated via the packages were found to be only one element of the support LEA personnel needed in attempting to install a new program. Some personal contact between the new users and experienced project staff appeared necessary--in part to convey programmatic information, but equally importantly to enhance the believability of the packaged materials and to provide moral support and encouragement.

Evaluation of the National Diffusion Network (The NDN Study)

Program Description. During 1975-1977, an indepth evaluation of the National Diffusion Network (NDN) was contracted by SRI from USOE. The NDN is a federally-sponsored program for spreading exemplary educational programs and practices to elementary and secondary schools throughout the nation.

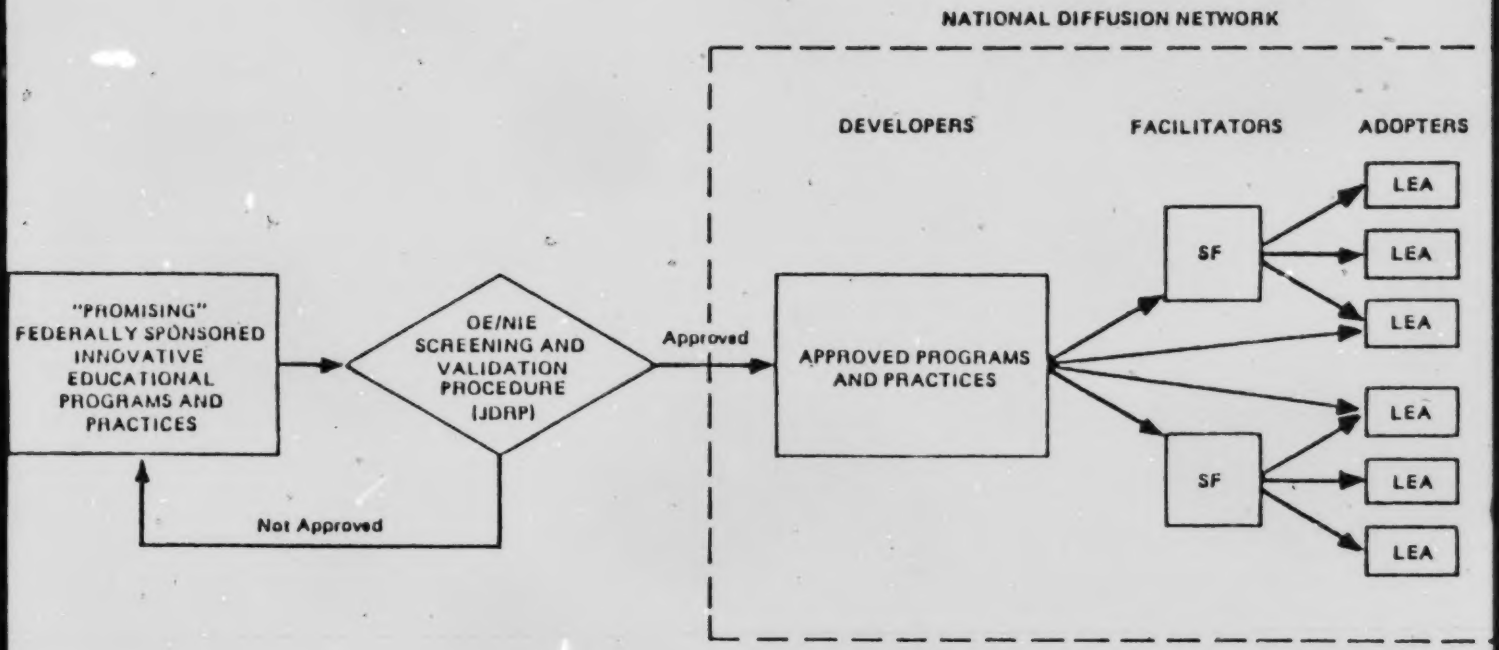
The goal or mission of the NDN is to effect widespread adoptions of validated innovations, as opposed to simply disseminating information regarding these programs. The targets of the approach are school systems--both public and nonpublic--referred to as adopters. The general structural features of the NDN are portrayed in Figure 1.

The NDN makes use of two categories of change agents--Developers and Facilitators--to accomplish this mission. The first category (Developer) refers to the change agent who is associated with the development, demonstration, and provision of implementation assistance for an innovation approved for dissemination by the Joint Dissemination Review Panel (JDRP). A given Developer in the NDN may be a single individual or a staff of several individuals. The defining characteristic is that Developers are associated with specific innovations.

"Facilitator," by way of contrast, is the term applied to change agents associated with specific regions (often entire states). Facilitators provide the link between Developers (with their innovations) and local schools, which are the targets of the system. The NDN places emphasis on practitioner-developed yet externally-validated innovations. NDN innovations typically do not emerge directly from R&D systems (although they may), and the Developer change agent is nearly always the innovator or project originator.

FIGURE 1

OVERALL SCHEMATIC OF THE NATIONAL DIFFUSION NETWORK, USOE



The innovations in the NDN pool are actual operating programs, developed and still in use in public school systems. Included is a broad range of program types, usually with multiple offerings in a given content area. The programs range from those that serve preschoolers to those that serve twelfth-graders; several programs also include parent involvement components. The innovations range in complexity from instructional units that can be added to a classroom's ongoing curriculum to organizational arrangements that may affect entire schools or school systems. The majority of the programs include instructional components, emphasizing curriculum content, instructional methods, or both. As such, the innovations are aimed primarily at the teaching staff within the schools. Although a majority focus on basic skills, such specialized areas as environmental studies, physical education, industrial arts, social studies, and the arts are represented.

The validation mechanism for the identification of innovations to be included in the NDN is the JDRP. Basically, the JDRP reviews programs and products targeted for federally-supported dissemination to ensure that claims of effectiveness are backed by sound evidence. The JDRP is not a formal component of the NDN. However, only programs approved by the JDRP are eligible to receive Developer/Demonstrator funds. Ultimately, then, the JDRP functions as a clearinghouse, a legitimizing agency, an indicator of federal educational priorities, a quality control mechanism, and a target criterion for innovators--the "Good Housekeeping" or "Underwriters Laboratory" seal of approval.

Program Assumptions. A fundamental aspect of the NDN is an emphasis on the use of person-intensive change tactics. Whereas most dissemination systems rely on information science technology to respond to user needs, the NDN approach relies very heavily on interpersonal tactics.

A second assumption pertains to the nature of diffusion and adoption of innovations. Architects of the NDN view school change as a process occurring over a (not necessarily linear) series of stages. Hence, emphasis has been placed on development of appropriate materials and tactics by change agents to support the change process at different stages.

A third assumption underlying the NDN strategy relates to the support of two categories of change agents: the Facilitators and the Developers. Facilitators do not function as program or technical experts, but as brokers and process specialists. They assist in identifying potential local education agency (LEA) adopters, and in facilitating the adoption process from initial awareness to program implementation and assimilation within the LEA.

Fourth, the NDN approach assumes that "demonstration" is a vital part of the awareness and adoption process. Accordingly, the funding policy of the NDN supports "demonstration sites" (makes funds available to sustain the Developer's "home" project), provides for Facilitator support of LEA visits to demonstration sites, and encourages "awareness demonstrations" by both Facilitators and Developers (both at regional and LEA site locations).

Fifth, the NDN approach assumes that strict replication is neither feasible nor desirable. Local adaptations of innovations are expected. Change agents are encouraged to identify and differentiate "essential core features" from adaptable components of their innovations. Also, they are encouraged to negotiate "adoption agreements" with LEAs, which are forms of social contracts specifying mutual roles and responsibilities.

Sixth, the NDN model places heavy emphasis on the development and provision of differentiated adoption materials. Usually several versions are developed, each corresponding to assumed stages or substages (initial awareness, secondary awareness, and implementation) of the adoption process. The

general assumption is that at all stages of the adoption process, some mix of in-person and materials support will be necessary.

Finally, the NDN approach assumes that "ripple effects" or secondary diffusion processes will occur for well-rooted adoptions. Both "lighthouse" and "turn-key" concepts are popular. These assume that successful adoptions will propagate in somewhat classical fashion.

Study Methodology. The four major goals of the SRI study of the NDN were:

1. To provide a comprehensive description of the evolution, organization, objectives, and operating procedures of the NDN.

2. To describe diffusion- and adoption-related processes used by NDN agents and provide insight into how these processes influence adoptions.

3. To evaluate the organizational effectiveness of the NDN and supporting components.

4. To conduct policy analyses on evaluation findings and advance specific recommendations regarding the continuation of the NDN.

The evaluation model used to address these questions combined the case study approach with process-outcome analysis. Baseline information was gathered by means of a questionnaire survey of 1974-75 NDN participants (including a sample of 1,000 school districts identified as Adopters by a Developer or a Facilitator) in the Fall of 1975, and a more comprehensive survey was administered to both new and continuing participants (150 change agents, 1,500 adopters) in the Spring of 1976. A multi-stage sample of continuing participants (16 Developers, 16 Facilitators, and 35 adopters) was identified for more thorough study, which involved site visits, interviews, observations, file reviews, and a more extensive LEA staff survey (including central administrators, principals, and classroom teachers). Variables developed from

survey data were analyzed by means of multiple linear regression techniques to establish relationships of processes and events (NDN tactics, innovation properties, and LEA characteristics) to outcome patterns. Results were interpreted with respect to how they corroborated or further elucidated descriptions of the NDN processes identified through observation, interview, and file review procedures.

Key Findings. The investigators describe the NDN diffusion/adoption process in terms of three continuous stages: initiation, implementation, and assimilation. The sequence of typical diffusion/adoption activities occurring in each stage is summarized in Table 2. Briefly, the initiation stage includes those activities intended to inform LEAs of the innovations, to build local interest in adoption of one or more programs, and to prepare LEA personnel to undertake implementation, or actual use of the innovation in their schools and classrooms. The third stage, assimilation, is the process by which the innovation is internalized by adopting personnel and becomes a regular part of the school's organization or curriculum. Only the first two stages, initiation and implementation, require active participation by the NDN.

Survey results indicate the program attained a high degree of success in creating awareness of the NDN programs and services, stimulating interest and activity on the part of school personnel, providing materials and training assistance to adopting schools, and providing subsequent implementation assistance and follow-up support. Program outreach included virtually all public and nonpublic elementary and secondary schools. Approximately 50 percent of those contacted responded with expressions of interest and requests for further information and materials. During the study year, secondary awareness demonstrations and conferences were provided to over 4,000 LEAs, and survey

TABLE 2

SUMMARY OF MAJOR CATEGORIES OF NDN DIFFUSION ACTIVITIES

Diffusion Stage/Category of Activities	Nature of Activities
INITIATION	
• Initial Awareness Activities	Facilitator agents use outreach mailings and follow-up contacts to surface potential adopters. Materials mostly limited to brief brochures. Different versions of materials usually sent to different targets (superintendents, principals, teachers, etc).
• Secondary Awareness Activities	Developers coordinate with Facilitators to provide indepth information to potential adopters. Regional and specialized conferencing, education fairs, and demonstrations. Materials more detailed. Visits to Developer site often involved (underwritten by Facilitators).
• Pre-implementation Training	Developers conduct indepth workshops (3-5 days) to prepare key adopter staff to implement. Training often conducted in adopter context. Often adoption agreement required. Training focuses on conceptual basis of innovation. Extensive materials.
IMPLEMENTATION	
• Post-implementation Training	Occasionally in-service training provided to adopters by Developer staff. Assistance in adapting to local setting.
• Follow-up Assistance	Moral support, evaluation assistance, and assessment of implementation conducted by Facilitators and/or Developers.
ASSIMILATION	
• Not part of NDN strategy	Local effects of adoption accrue.

data indicated that in excess of 2,000 of these LEAs received some form of adoption training, materials, and implementation assistance.

Of the 1,460 LEAs surveyed, over 80 percent claimed to be implementing their adopted innovation and were confident that the implementation would lead to assimilation. The pattern of adoptions was reasonably well-dispersed both geographically and by innovation type. However, adoptions tended to be concentrated in elementary schools in non-urban school districts.

A process-outcome analysis identified the following as significant determinants of change agent effectiveness:

1. Thorough, persistent, and appropriately segmented outreach campaigns, in which varieties of awareness materials and tactics are employed selectively to target audiences within the educational community.

2. Personal follow-up tactics, either by telephone or by in-person visits, making extensive use of personal referral networks.

3. Early involvement of administrative and instructional decisionmakers within the client schools, particularly for secondary awareness and demonstration activities.

4. Coordinated awareness conferences in which Developers and Facilitators team up for regional conference activities.

5. Interpersonal style of the Developer, particularly in terms of client homophily, human relations skills, and leadership style.

6. Resource/organizational support by Facilitator, primarily in terms of securing administrative concurrence and enabling LEA personnel to visit demonstration sites.

7. Emphasis on local commitments, such that Developer, Facilitator, and adopter agree on the specifics of the intended adoption.

8. LEA visits to demonstration sites, which provide visible models and referents for the adopting LEA.

9. In-person training of key instructional and administrative staff by the Developer, often involving extensive on-site assistance.

10. Focus on the "spirit" of the innovation, as opposed to form, structure, or mechanics.

11. Emphasis on practitioner change, such that the innovation focuses on having the staff improve their own effectiveness, independent of expensive materials or resources.

12. Well-articulated adoption materials, which amplify training components and are complete, well organized, comprehensive, and detailed.

13. Phase-in of implementation, beginning with only a few interested and competent staff in a few classrooms or schools, and gradually extending to other elements of the site.

14. Return visits by both Facilitator and Developer, generally during the implementation year, to assist, evaluate, and reassure as needed.

In analyzing the overall NDN approach, the investigators' central conclusion was that interpersonal or person-intensive components of the NDN constitute its most distinctive feature in terms of its overall effectiveness in producing directed change. In addition, the investigators concluded that the following appear as key factors in NDN effectiveness as a dissemination program:

- The requirement of JDRP approval, which supplied a sense of legitimacy, quality control, and special status to the innovations.
- The availability of a variety of innovations for any given adopter interest, which provided opportunities for user choice.
- Specialization of change agent functions (Facilitator as the change process specialist, Developer as the innovation specialist), which minimized administrator versus practitioner conflicts.
- OE's emphasis on goals and their maintenance of a low administrative profile, which produced both competition and cooperation among change agents, resulting in high activity levels and a considerable sense of esprit.

The investigators concluded that the NDN represents one of the few highly successful federal efforts to make wide-scale use of important developmental improvements in educational state-of-the-art. The approach was judged politically viable and contrary to findings from evaluation of less-structured change efforts (i.e., the federal seed money programs studied by Rand), the

NDN approach appeared to produce sustained effects at very low perceived local costs. Nine out of ten local NDN adopters surveyed reported that their adoptions address important, locally-recognized needs; are working well; cost their districts less than $2,000, and represent a clear improvement over previous practices. LEA satisfaction with adoptions is further evidenced in local personnel's advocacy of their projects to other school people. The NDN evaluators concluded that enthusiastic, experienced users became the best salespersons for the innovations.

Assistance Strategies of Six Groups that Facilitate Educational Change at the School/Community Level (The TAG Study)

Program Description. In May of 1974, the National Institute of Education awarded a grant to the Center for New Schools (CNS) to conduct a systematic search for, and subsequent in-depth analysis of, groups or organizations which were effective in promoting school or school community change and improvement through direct in-person assistance. A national search by the research team to identify such groups identified over 100 such organizations. The research team contacted these organizations and explored their characteristics and their interest in participating in a study. Groups were selected for study using two sets of criteria:

1. Stability and effectiveness criteria--it was assumed that more would be learned from looking at groups with some measure of organizational stability, a reasonable degree of clarity about what they were doing to change schools, and some past record of effectiveness in improving schools.

2. Diversity criteria--the intent was to study a range of organizations differing on a variety of dimensions (e.g., focus or topic of intervention; assistance methods employed; staff organization, management, and leadership style; and use of feedback or research findings).

The specific programs selected for inclusion in the TAG study were:

AFRAM Associates (AFRAM). A Harlem-based group that has provided assistance to parents at eight Follow-Through program sites in four states and Washington, D.C. AFRAM attempts to help parents become full partners in their children's education in terms of decisionmaking and day-to-day involvement in school programs.

Center for New Schools (CNS). A group that has attempted a variety of assistance strategies for changing urban schools, with an emphasis on using qualitative research studies of successful change efforts as a source of information for assistance.

Creative Teaching Workshop/Experiential Systems, Inc. (CTW). An advisory group that has worked with principals and teachers in several New York public schools. CTW focuses on using concepts and techniques of direct experiential learning with both children and adults.

Institute for the Development of Education Activities, Inc. (/I/D/E/A/). A group of educators who developed Individually Guided Education (IGE). IGE is an approach to individualizing student learning programs that entails a changed approach to planning and carrying out instruction, on-going staff development, and social reorganization of the teaching staff. Having developed a change strategy and related materials, /I/D/E/A/ staff have trained staff from intermediate agencies (such as state departments of education) to provide ongoing assistance for carrying out the IGE program in over 1,200 schools.

Rural Education Program (REP). A group developing a strategy for assisting rural schools and communities to carry out a systematic problem-solving process to deal with priority local school problems. REP has field-tested their approach through training and supporting local facilitators who have worked in several dozen rural school districts and has developed training and support mechanisms within state and intermediate education agencies to assist the change process at the local level.

United Bronx Parents (UBP). A group of parent activists in the South Bronx section of New York City who assist South Bronx parent groups to increase their influence in local schools. UBP assists parents through training, acting as advocates for individual students, and community organizing (Moore et al., 1977, pp. 2-3).

These six TAGs represent an unusually broad spectrum of philosophical, political, and curriculum orientations regarding the nature, locus, and strategy for effecting school change. The three salient characteristics of these TAGs, then, are that they:

1. Were engaged in providing direct assistance to particular schools or school communities over an extended period;

2. Differed markedly from each other in the nature of their direct assistance strategies and component tactics; and

3. Had considerable experience and some record of effectiveness in implementing their strategies and accomplishing their chosen objectives for school change.

Program Assumptions. In contrast to the preceding four studies included in this report, the TAG study did not focus on a single program or strategy for effecting school change, but rather on a carefully selected collection of approaches which differed explicitly in terms of important program assumptions, but all of which were based on a common assumption that some human change agent was fundamental to effecting change in local schools. The programs selected for study differed in terms of their educational change goals and objectives, the theoretical and philosophical traditions from which they grew, the focus or topic of intervention, the role groups targeted for intervention, the strategies adopted and tactics employed, and the styles by which they organized and managed their intervention efforts. The assumptions underlying programs selected for this study, then, at least partly overlap with those of the PSDP study (that human intermediaries are necessary to initiate directed change) and the NDN study (that no single approach will be "best," and the continuous involvement of change agents is essential). However, the TAG study goes well beyond these other studies in both breadth and depth of issues and assumptions, and thus provides an excellent framework for integrating, synthesizing, and generalizing findings across the full collection of studies being considered.

Study Methodology. Four major study goals served to structure the research methods employed. The research team sought to identify, describe, and understand:

1. The internal functioning of each TAG.

2. The processes and procedures by which each TAG provides assistance to clients (schools, community members, etc.).

3. The procedures and conditions associated with differences in TAG effectiveness, in light of individual TAG goals. Here the investigators were more concerned with understanding the contextual constraints on effectiveness (i.e., short-term effectiveness of strategies in specific settings) than with generalizing about inter-TAG effectiveness.

4. Similarities and differences among TAGs along all dimensions, so as to add to the knowledge base about educational improvement.

The primary study method was participant-observation, designed to develop a large body of contextually-rich information for subsequent analysis and interpretation. Although this method was the least "statistical" of the five studies summarized in this synthesis, a great deal of discipline and care was exercised in the gathering of qualitative data, such that in many ways, the TAG study is the most informative for synthesis purposes. Indeed, we would strongly advise those planning to provide or currently providing change-oriented assistance to read the six TAG case studies.

The investigators make explicit their intent to avoid a hypothesis-testing (hypothetical-deductive) approach, in preference for an inductive or "Grounded Theory" orientation. That is, rather than setting out to prove or disprove a set of specific hypotheses, they strove to observe, document, classify, and then to understand the phenomena under investigation. They assumed that this approach was most appropriate to studying a subject about which little was known.

However, the investigators believed that an initial broad framework was necessary from which to observe, document, and classify. Therefore, they began with a social system view of schools. Schools were viewed as loosely-coupled organizations, interdependent with other systems, and characterized by multiple, unclear goals. Furthermore, the researchers used such concepts

as roles, norms, functional subsystems, routines, decision rules, and standard operating procedures as an initial "bookkeeping system" for collecting data. Finally, in light of evidence from such fields as medicine, agriculture, and merchandising, they assume that personal contact is the key influence in the adoption/implementation process, and that adaptation of innovations to local needs is critical to effective implementation.

Each TAG was visited for a period of about six weeks. Case study activities conducted during this period included indepth interviews with TAG staff, observations of the TAGs' internal functioning and interactions with clients, and special focus on at least two projects of the TAG, including interviews with clients in these projects. Data in the form of field notes from these interview/observation activities were prepared and systematically analyzed to develop within-TAG and across-TAG findings as follows.

Within-TAG Findings. Based on the field notes, several hundred "propositions" were prepared about each TAG's work. These propositions (e.g., the group places a constant emphasis on the transfer of skills and knowledge to clients and resists doing things "for" them) were developed and refined by reviewing field notes and by further data collections; they became the basis for preparing individual case studies.

Across-TAG Findings. A common set of cross-site questions was developed and propositions answering these questions for each group were prepared. This set of cross-site propositions became the basis for discussing similarities and differences among groups.

Key Findings. The study's major findings pinpoint components and processes which characterize effective TAGs. The research team identified components and processes in four major areas of TAG activity:

1. Internal TAG organization and leadership.

2. Funding (time and effort devoted to seeking and maintaining funds and support).

3. Development and refinement of assistance strategies and tactics.

4. Implementation and adaptation of specific assistance components.

The investigators stress that findings within and across these four areas are highly interrelated. Internal management problems, for example, cause significant difficulties in efforts to aid schools. One important theme underlying all findings is "mutual adaptation" (a concept taken from the FPSEC study discussed earlier). Effective TAGs clearly stood for something. They had developed carefully thought out ways for carrying out all major aspects of their operations. It was the coherence of their approach that motivated many parents and school staff to respond to the TAG's ideas and assistance. However, effective TAGs thoughtfully modified and adapted their approach to new problems and differing local conditions. Thus, effective TAGs both stimulated change and were themselves changed in the process.

The key findings can be summarized as follows:

1. Internal TAG Organization and Leadership

- The TAG's founding is the most critical event shaping subsequent activity. Assumptions about the nature of schooling and how schools should be improved are elaborated, but are seldom fundamentally changed in the TAG's later history.

- Effective TAGs usually have strong leaders who draw together the necessary staff and resources, project a clear direction and set clear limits, and are regarded by TAG staff as the legitimate interpreters of the TAG's strategy.

- TAGs must perform a complex set of interdependent tasks and deal with many organizations in their environment over which they have limited control (e.g., funders, school principals). This reality thrusts a complicated managerial task on TAG leadership, who may initially have had little managerial experience. The adaptation by TAG leadership to these managerial demands is a key determinant of the organization's viability.

- Effective TAGs usually have careful programs of staff selection and socialization. They seek staff who (a) accept the basic philosophical assumptions of the TAG, and (b) have had relevant experience in carrying them out on the school community level. Ideally, socialization of TAG staff is carefully planned and includes direct experience in providing assistance, analysis of that experience, planned training sessions, supportive written materials, and regular feedback on performance.

- Effective TAGs strike a balance between autocratic and totally participatory decisionmaking. They develop understandings about what decisions should be most appropriately made by people with different roles in the organization.

- Expansion and geographical dispersion are major strains on TAG operation. TAGs with about seven staff members who are in regular face-to-face contact with each other can use operating methods that become dysfunctional with a larger staff dispersed to a number of branch offices.

2. Funding

- Effective TAGs develop sophisticated ongoing fund-raising and fund maintenance activities. Duration of funding is a key determinant of success, since it takes several years of experience to develop an effective strategy.

- The internal and external activities of the TAG are highly interdependent. Internal management and fund-raising absorb significant amounts of the TAG's human resources. TAG staff are usually under pressure to show quick results because of brief funding cycles.

3. Development and Refinement of Assistance Strategies and Tactics

- Effective TAGs develop over time an assistance strategy that has increasing coherence, is stated concretely enough to have implications for action in specific situations, and is generally acted on by TAG staff. Absolutely essential to effective strategy development is a regular process of assisting specific school communities and then reflecting on these assistance efforts. The existence of this analysis-assistance cycle is one of the strongest predictors of TAG effectiveness.

- Without a clear focus in terms of assistance activities and objectives, the facilitator's work becomes diffuse and idiosyncratic, accomplishing little. TAGs that merely "turn facilitators loose" to help schools are ineffective.

- Effective TAGs become increasingly sophisticated at "mapping" the systems they are trying to change. They predict, for example, what the effect of assisting a group of energetic young teachers will be on the school principal and on older teachers who see the young teachers as a threat, and they modify their tactics accordingly.

- Effective TAGs take great care in planning entry and in relationship-building, carefully deciding whom they will interact with, about what, and in what contexts. If this process is successful, it will establish TAG credibility with clients, establish mutual obligations for the assistance process, and allow the TAG staff to assess whether their capabilities match the needs of the potential client.

- Effective TAGs use well-prepared materials as an integral part of direct assistance. Effective materials are developed as a direct outgrowth of assistance efforts. They are clearly and simply written and of good technical quality. They often consist of short handouts, booklets, filmstrips, etc., that can be used individually to address an immediate information need.

4. Implementation and Adaptation of Specific Assistance Components

- Effective TAGs blend four major techniques for providing assistance: (1) structured experiences (e.g., workshops), (2) over-the-shoulder assistance (e.g., advice as part of a parent strategy session), (3) modeling (e.g., demonstrating a new teaching technique by working directly with a student), and (4) providing materials. Effective TAGs minimize doing things for clients.

- TAGs are most effective when they develop a coherent underlying philosophy and guidelines for action in specific situations, but allow for flexibility to meet local conditions.

- Effective TAGs constantly encourage independent initiative on the part of clients and take great pains to avoid developing dependency.

- Effective TAGs see the school community and its environment as a social system (although they may never verbalize their analysis in social science terms), and they press for changes in roles, relationships, and procedures--they consciously work for the incorporation of the changes they espouse into the basic social fabric of the school community.

The study also reports on several findings regarding limitations of change introduced even by the most effective TAGs. For example, the investigators assert:

- There are few "ripple effects" in school change efforts. Those aspects of the school community that are the focus of the most intensive change efforts often do not produce concomitant changes in other aspects of the school community. Changes in parent-principal relationships do not necessarily produce changes in instruction. Changes in the process of instruction do not necessarily cause teachers to reexamine content. Changes in one classroom do not necessarily lead to change in others.

- Constraints imposed by the characteristics of local school communities are so powerful that it seems unlikely that one "best" approach to change can be developed. The existence of such limits strongly suggests that one of the most important decision TAGs make is whether they can be effective if they agree to help a particular school community.

- In the absence of a reliable technology of education, value orientations assume a central place in assistance efforts. Although TAGs often cite scientific evidence to buttress credibility, key aspects of their strategies can be traced to personal beliefs and values that are not based on empirical evidence.

In addition to these generalizations of effective TAGs offered by the investigators, a great number of insights are available from this study. For example, virtually all of these TAGs make use of personal referral networks in soliciting clients. Also, although the investigators do not dwell on them, the TAGs have experienced a great number of problems, difficulties, and failures in their efforts. In most instances, these problems and failures can be well understood from the social-organization perspective the investigators employed.

TABLE 3A

BRIEF DESCRIPTION OF THE DISSEMINATION/UTILIZATION PROGRAMS

PROGRAM	PROGRAM GOALS	PROGRAM STRATEGY: SCOPE AND RESOURCES
Pilot State Dissemination Program (PSDP)	To stimulate use of comprehensive information and technical assistance resources within school systems, to develop state capacity, and commitment to dissemination of educational programs and practices.	Three-year federal contracts (later changed to grants) to three state education agencies to set up and test dissemination capabilities combining centralized information retrieval facilities with decentralized field agents assigned to specific within-state areas to assist school personnel in requesting and utilizing information resources.
Federal Programs Supporting Educational Change (FPSEC)	To stimulate local development and utilization of improved programs and practices in reading (Right-to-Read), career awareness and readiness (Vocational Education, Part D), bilingual education (ESEA, Title VII), and priority areas defined at state and local levels (ESEA, Title III).	Federal "seed money" grants to local education agencies in 50 states: ESEA, Title III -- $150 million/year ESEA, Title VII -- $45-85 million/year Right-to-Read -- $12 million/year Vocational Education, Part D -- $16 million/year
Project Information Packages (PIP)	To provide an effective means for replicating exemplary reading and math compensatory instructional programs in new schools.	Six exemplary projects in reading and math were identified and information packages detailing project materials, scheduling, start-up, and operational requirements were prepared. Nineteen "try out" grants were awarded to LEAs (approximately $100,000 per year each) to replicate the exemplary projects on the basis of the packaged (PIP) materials alone.
National Diffusion Network (NDN)	To spread exemplary elementary and secondary educational innovations developed under federal funding and validated by the Joint Dissemination Review Panel to new schools nationwide.	Discretionary grants were provided to 72 developers of exemplary (validated) innovations. Average grant size of $75,000 per annum supported demonstration sites and related activities. Grants averaging $100,000 per annum were also provided to 66 state and regional intermediaries to facilitate the diffusion and adoption of developer projects. A national "network" was created. Developer projects ranged from basic skills to open education, from early childhood education to high school levels, from physical education to district budgeting, etc.
Assistance Strategies of Six Technical Assistance Groups (TAG)	To achieve specified educational changes or reforms (idiosyncratic to specific TAGs) by providing direct assistance services to selected local school communities over an extended period of time.	From over 100 Technical Assistance Groups, or TAGs, six successful educational change projects were selected for indepth study to identify the factors relating to their success. No central support agency was involved and each TAG secured support on an ad hoc basis. TAGs differed substantially in their change goals and tactics used. They emerged from traditions of organizational development, alternative education, open education, individualized education, community organizing, formative evaluation, and child advocacy.

TABLE 3B

ASSUMPTIONS UNDERLYING DISSEMINATION/UTILIZATION PROGRAMS

PROGRAM	CENTRAL PROBLEM AS DEFINED OR IMPLIED BY THE PROGRAM	NATURE OF CHANGE PROCESS
Pilot State Dissemination Program (PSDP)	Research results and other information constitute potentially valuable resources, but they are under-utilized because school system personnel generally lack the motivation and/or skills required to seek and make use of external resources without the assistance of a personal intermediary.	• Articulation of local needs, interests, and priorities, combined with ready access to information resources, will promote information-seeking behavior. • Provision of information that is relevant to local needs and priorities will promote use of improved practices and programs.
Federal Programs Supporting Educational Change (FPSEC)	Schools lack the "slack resources" necessary to develop and test new and improved programs and practices in response to priorities defined at the national (Title VII, Right-to-Read, Voc Ed) and state or local (Title III) levels.	• School systems are motivated to conduct extensive searches for appropriate innovations. • School personnel will select programs and practices on the basis of rational considerations; school systems will use evaluations to judge the merits of their new programs. • Effective programs will be continued beyond the withdrawal of federal support, while unsuccessful programs will be discontinued.
Project Information Packages (PIP)	Conventional approaches to dissemination of exemplary projects (e.g., ERIC, technical assistance) are both uncertain in their effectiveness and costly in time and resources.	• Most schools are aware of and eager to replace their ineffective math and reading compensatory education programs. • School staff can assess their needs and interests and can select appropriately from among available "improvements." • Essential features of effective projects can be communicated by written materials. • Staff required to implement the effective project exists within the adopting LEAs. • Replication of the essential features of the project will result in replication of outcomes. • The packaging (PIP) model will become cost-effective in that it will reduce time required to implement the project, as well as the costs and uncertainties of in-person dissemination approaches.
National Diffusion Network (NDN)	Because of the large federal investments in the development of exemplary educational innovations, an effective system was needed to improve the diffusion (spread) of these innovations to other schools and communities nationwide.	• Active promotion of validated innovations is needed for widespread adoption. • Adoption is an interactive process involving a progression of adopter stages. • External intermediaries can best serve to "broker" innovations to LEAs, matching LEA needs with program offerings. • "Demonstration" is a necessary component to develop adopter interest and to transfer knowledge. • Adaptation is necessary to develop local commitment and ownership. • Materials and technical support are necessary to sustain adoptions. • Secondary diffusion will occur for well-rooted adoptions.
Assistance Strategies of Six Technical Assistance Groups (TAG)	Rational mechanistic models of the change process were inadequate to a useful understanding of school change and improvement.	• Educational change inevitably entails altering social system aspects of school community. • Change is difficult because school communities are loosely-coupled organizations. • Because of multiple unclear goals, incentives for school staff change are weak. • Given these characteristics of schools, the implementation process is critical in educational change. • Personal contact is a key influence in the adoption and implementation process. • Adaptation of innovations to locally perceived needs is crucial. • School communities are interdependent with other social systems.

TABLE 3C

FEATURES OF THE STUDIES OF THE DISSEMINATION/UTILIZATION PROGRAMS

PROGRAM	STUDY GOALS	STUDY SCOPE AND METHODOLOGY
Pilot State Dissemination Program (PSDP)	1. To assess the impact of the PSDP on information-seeking behavior among school personnel. 2. To assess the impact of the PSDP on utilization of information. 3. To identify factors contributing to program impact. 4. To identify problem areas.	Two-year field observation of field agents and retrieval operations in each state; case study and descriptive analysis of data. Event-linked survey of over 900 clients requesting information (all clients, in targeted and non-targeted areas, requesting information during a five-month period in the second year) focused on status of client, response to information, assistance received from agent or others. Review of information request forms associated with clients surveyed to determine nature of request, turnaround time, search(es) conducted, materials provided.
Federal Programs Supporting Educational Change (FPSEC)	1. To provide insight into how the process of innovation operates within school systems and into what factors influence this process and its outcomes. 2. To identify and develop policy implications of findings for future federal efforts to promote change in schools.	Multiyear study conducted in two phases, with Phase I focused on issues of initiation and implementation and Phase II focused on incorporation. Phase I included an in-person questionnaire survey of grant recipients at 293 LEAs, followed by indepth studies at 25 LEAs; regression analysis of survey data, coupled with qualitative analysis and synthesis of indepth studies. Phase II included follow-up visits to 100 Title III sites and 11 Title VII sites.
Project Information Packages (PIP)	1. To discover the extent to which PIPs successfully produce replications of the exemplary projects in new sites. 2. To discover and correct deficiencies in the PIP materials. 3. To assess the extent to which replication sites attain the same pupil outcomes as the originating sites report.	Intensive survey of teachers, administrators, parents, and pupils at end of Years 1 and 2. Detailed observation and interviews of staff and project operations (training, start-up, operations) Years 1 and 2. Discrepancy analysis of implementations. Norm-referenced and curriculum-referenced analyses of pupil learning. Qualitative analysis and synthesis of pupil effect; parent, teacher, and administrator survey measures; and case studies.
National Diffusion Network (NDN)	1. To provide a comprehensive description of the evolution, organization, objectives, and operating procedures of the NDN. 2. To describe diffusion- and adoption-related processes used by NDN agents and provide insight into how these processes influence adoptions. 3. To evaluate the organizational effectiveness of the NDN and supporting components. 4. To conduct policy analyses on evaluation findings and advance specific recommendations regarding the continuation of the NDN.	Baseline survey of 1,306 client LEAs and an overlapping year-end survey of 1,460 clients to assess initiation, implementation, and continuation processes and events. Extensive survey of all change agents. Case studies of 32 change agents and 35 adopters. Case studies of conferences, training, and teacher assistance components. Multiple regression and qualitative analysis and synthesis of data.
Assistance Strategies of Six Technical Assistance Groups (TAG)	1. To study the internal functioning of individual TAGs. 2. To study the processes by which individual TAGs provide assistance to clients. 3. To study techniques and circumstances that lead to greater or lesser effectiveness of assistance efforts (emphasis on short-term effectiveness of tactics in particular contexts rather than on inter-TAG comparisons. 4. Comparison of similarities and differences across TAGs in a number of selected areas.	Using a social systems perspective (focus on roles, norms, functional subsystems, routines, decision rules, and standard operating procedures), indepth case studies were conducted over 6-week periods on each TAG. Detailed field notes were organized and analyzed into sets of "research propositions," both for within-TAG and across-TAG issues, which became the base for case study reports and findings of TAG similarities and differences.

TABLE 3D

KEY STUDY FINDINGS

PROGRAM	PROGRAM OUTCOMES AND EFFECTS	EXPLANATION OF EFFECTS
Pilot State Dissemination Program (PSDP)	The PSDP was successful in stimulating information-seeking behavior among LEA personnel. Field agents were uniquely successful in encouraging classroom teachers and others relatively low in the district hierarchy to seek and use external information resources. The majority of requests for information received from practicing educators concerned curriculum and instructional methods.	Attributes that contributed to the success of field agents included: (1) their status as generalists, able to shift roles and willing to respond to a variety of local needs; (2) their position as outsiders to the systems they were attempting to affect; and (3) their lack of power to mandate change. Factors that had both positive and negative consequences for the evolving organizations were: (1) lack of a well-developed model; and (2) organizational dispersion.
Federal Programs Supporting Educational Change (FPSEC)	Federal seed money programs were successful in stimulating initiation of a large number of local efforts consistent with program guidelines, but many programs were not successfully implemented, and only few were sustained beyond the withdrawal of federal "seed money" support.	Success was due to a host of local, rather than program-specific, factors, the most important of which are: (1) problem-solving motivation for initiation; (2) attempt to effect significant changes; (3) strong teacher sense of efficacy; (4) implementation strategy that promotes mutual adaptation of the program and the users; (5) organizational climate receptive to the change being introduced; and (6) high level of local capacity to manage change effort.
Project Information Packages (PIP)	The six Project Information Packages tested were effective devices for communicating management aspects of projects that make use of straightforward commercial materials and instructional techniques. However, structural replication of the management features of an effective project did not guarantee replication of the original instructional program or of the student achievement gains realized at the original site.	The original PIPs lacked extensive curriculum and pedagogical details, which were later supplied in revised PIPs. Yet even with complete information, some in-person interaction (replicators with change agents) was generally needed. Also, staffing is a crucial component in determining project effectiveness.
National Diffusion Network (NDN)	During the first two years of operation, well over 2,000 adoptions of NDN innovations were effected. Of these, over 1,000 appeared to be thoroughly implemented and well-rooted within the LEA. Ninety percent of the 1,430 LEAs surveyed reported their adopted innovations address important locally-recognized needs; are effectively satisfying these needs; cost their district (on the average) $2,000 or less; and represent clear improvements over previous educational programs or practices. The NDN approach appears to be highly effective in creating wide-scale LEA awareness, interest, adoption, and subsequent implementation of the innovations being diffused.	Factors accounting for successful adoptions were: (1) thorough, persistent, and well-differentiated awareness activities; (2) early involvement of administrative and instructional decisionmakers and emphasis on local commitment; (3) extensive use of in-person tactics at all stages of the adoption process, including follow-up visits; (4) provision of comprehensive and well-developed materials to support adoptions; (5) personal dynamics of the Developer and management skills of the Facilitator; (6) emphasis on practitioner change, phase-in of implementation, and low reliance on expensive resources; and (7) support of LEA visits to demonstration sites. Adoption patterns appeared reasonably uniform by innovation type and geographic area, but disproportionate in terms of school level and district urbanism. Much of the overall NDN success is attributed to effort and enthusiasm of participating change agents.
Assistance Strategies of Six Technical Assistance Groups (TAG)	Some major findings are that successful TAGs: (1) have strong leaders who adapt to managerial demands of a complex organization; (2) carefully select and socialize staff; (3) carry out a cycle of analysis and assistance through which they refine a strategy that specifies implications for action in specific situations; (4) become increasingly sophisticated in "mapping" the social systems they are trying to change; (5) carefully plan entry and relationship-building aspects of their work; (6) blend structured experiences like workshops, over-the-shoulder assistance, modeling of desirable practices, and the use of brief well-prepared materials in their assistance efforts; (7) constantly encourage independent initiative by clients; and (8) consciously work for the incorporation of the changes they espouse into the basic social fabric of local school communities.	TAG success is explained in terms of four dimensions of activities: (1) external organization and leadership; (2) effectiveness in attracting and maintaining funds and operating resources; (3) the development and refinement of assistance strategies and tactics; (4) the implementation and adaptation of assistance components to specifics of the client context. The dominant factor, however, is the continuous in-person interaction of TAGs with clients over extended periods of time.

III. CROSS-STUDY SYNTHESIS

In recent years, many critics of intervention efforts have questioned seriously the premise that our current educational institutions are amenable to improvement-oriented change.* Much of this pessimism grew out of frustrations with apparent failures of major reform programs (e.g., ESEA Title I, Follow-Through, ESAA) to produce dramatic improvements in the quality of education and with the inability of the educational technology movement to deliver on claims made by its proponents.

The evidence from the five major studies included in this synthesis indicates, to the contrary, that large-scale (i.e., reaching into many schools and districts) directed educational change is possible, and that such change occurs in an orderly and reasonably predictable (if not yet widely understood) manner. Each study focused on somewhat different change goals and programs for attaining these goals, yet all were keyed to the study of processes and events which might relate to differences in goal attainment. Accordingly, these studies show not only the extent to which intended change is likely to occur, but, more importantly, many of the key conditions and factors which influence its occurrence.

The study of the Pilot State Dissemination Program (PSDP) shows that school staff can and will make use of external sources of knowledge and information and that they perceive such use as leading to improvements in educational practice. The study of Federal Programs Supporting Educational

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* Improvement-oriented change is defined as modifications to organizational structure, curriculum, teaching practices, etc., undertaken with the ultimate intent of enhancing educational productivity.

Change (FPSEC) shows that seed money programs do occasionally stimulate major program improvement, but that the process is complex, costly, and by no means certain. The study of the Project Information Packages (PIP) field test shows that school personnel can in fact create operational replications of effective educational projects on the basis of descriptive materials alone, but, more importantly, that structural replication will not necessarily render the new project effective. The National Diffusion Network (NDN) study shows the enormous power a network of innovation developers and regional facilitators have in stimulating and effecting large-scale adoption and implementation changes. Finally, the study of the six Technical Assistance Groups (TAG) shows that a number of basic properties characterize successful change agent operations irrespective of their specific change goals.

With the possible exception of the TAG study,* all the studies addressed the general issue of whether and how a given federal intervention strategy (program) stimulated improvement-oriented change. All are based on the implicit assumption that external intervention of some sort (the provision of slack resources targeted for particular programmatic developments; the support of regional intermediaries to serve as extension agents; the support of various categories of dissemination, demonstration, training, and on-site assistance activities, etc.) is needed to accelerate and/or direct the change process.

Although no intervention strategy was found to be foolproof, each was found to have some success. And each study has contributed to our

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* The six TAGs included in the study varied in their change goals, strategies, and type of operational support. Thus, the TAG study did not investigate a federal intervention program per se, but six independent, relatively successful change advocacy programs.

understanding of how the dissemination/utilization process operates in school systems. In the remainder of this chapter, we present our synthesis of the five studies. Our discussion focuses on the strong-inference syntheses--those for which findings from most or all the studies concur. We also discuss issues for which findings conflict, examining the sources of apparent conflicts across the studies with some suggestions as to how they might be resolved. Finally, we discuss what appear to be the action implications based on this synthesis--in terms of guidelines for an effective approach to facilitating knowledge utilization/change.

1. Meaningful change occurs as a process, not as an event.

Perhaps the most valuable contribution of these five studies is their combined focus on the processes involved in school change. From these study findings it appears there are two separate but parallel dimensions to this change process: a personal dimension which involves the change process occurring within individuals (cognitive, behavioral, affective) as they acquire and make use of new knowledge, and a systemic dimension, which involves the concomitant changes occurring in the user environment (organizational, social, political). Furthermore, these separate but parallel processes appear to unfold as interdependent stages, both within and across dimensions.

A third dimension which serves to guide and facilitate the utilization process will be referred to as technical support. This dimension consists of the information, materials, and resources, as well as the people (linkers, change agents, Developers, Facilitators, intermediaries, technical assistance groups, etc) that are external to the user environment but are involved in the change process.

The "process" orientation of these five studies enables us to draw many inferences regarding the nature of these dimensions and stages of change--

their determinants, their consequents, and their dynamic interplay. Three stages most often identified are initiation, implementation, and incorporation.* Initiation refers to the process by which potential users are made aware of and become interested in utilizing or "trying out" some new or different idea, development, program, or practice. Implementation refers to the processes involved in actually trying out, making use of, or putting into practice the new knowledge or idea. Incorporation refers to a process through which the new knowledge becomes part of the standard operating procedure of the school community.

While the studies often refer to these stages as if they were discrete states of user behavior, closer inspection suggests they are relatively continuous, overlapping processes, differing primarily in terms of relative dominance at any given time. For example, awareness and interest are requisites not only for information-seeking behavior (initiation), but also for implementation and incorporation activities. Similarly, various forms of practice and experience in making use of new information (implementation) are shown to be essential components of the incorporation process.

As can be seen in Table 3 (pp. 46-49), the technical support dimension defines the primary distinctions among the five studies included in this synthesis. That is, programs differed primarily in their implicit and explicit assumptions regarding what technical support components, strategies, and configurations were needed to produce directed change and utilization. In the case of the PSDP, an intermediary with knowledge of and access to information resources (ERIC) served to stimulate utilization of these resources

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* Incorporation is also referred to as "continuation," "assimilation," or "institutionalization."

among clients in school systems. In the FPSEC study, the technical support dimension consisted of categorical and discretionary grants to support locally initiated improvement or change efforts and to make use of technical assistance. In PIPs, comprehensive "how to" materials packages and implementation grants constituted the technical support dimension. In the NDN, technical support comprised two categories of grant-supported change agents--Facilitators (similar to PSDP intermediaries) and Developers (usually local school personnel who had successfully exploited the seed money initiatives provided by the change agent programs). Finally, the TAG study involved a variety of support configurations, but a common "direct assistance" strategy.

Because each of these studies employed a process view of utilization and change, as opposed to the more common input-output methodologies characteristic of many federally supported evaluations, it is possible to look across the findings and develop some insight into how the personal, systemic, and technical support dimensions interact as the process unfolds. Even more important, however, is the compelling evidence from these studies that educational utilization and change is, in fact, a gradual, complex, multiply determined process. Although this finding may not come as a surprise to students of human or institutional behavior, it is important to recognize that it is not part of the conventional wisdom. We strongly suspect the failure of the vast majority of centrally sponsored educational and social reform programs is due almost entirely to oversimplification of, or inattention to, this complex process. Utilization and change are too often viewed as if they were events rather than processes. Many reforms have been judged failures because their "adoption" did not produce clear, measurable, and reliable improvements. Yet many of these reforms simply never got implemented, let alone incorporated within schools and classrooms.

2. Directed personal intervention is by far the most potent technical support resource, and may be a necessary condition for many forms of utilization.

To the extent the goal of a dissemination program is to produce some utilization and change in local school systems, it appears quite clear from the studies reviewed that some amount of in-person mediation will be needed. The evidence for this assertion is consistent across the studies. Even in the PIP field test, where external technical assistance was discouraged, replicators frequently sought assistance, clarification, and reassurance from project originators, packagers, evaluators, and USOE. The need for external interaction was expressed even by those staffs who had correctly interpreted the PIP features and instructions and had properly implemented their projects from the start.

The potency of direct personal interventions is clearest in the PSDP, NDN, and TAG studies. The PSDP study found that information-seeking behavior increased dramatically in those districts served by linkage agents; the proportion of staff requesting information was over 1,000 times greater than in districts not served by the PSDP intermediaries. Similarly, the NDN study shows dramatic differences in adoption/utilization patterns across regions (or states), corresponding very closely with the nature of awareness and follow-up campaigns used by the Facilitators. Other things being equal, the level of utilization within a state or region was best predicted by the extent to which Facilitators made use of in-person tactics to inform, assist, and support potential adopters. Further, the one characteristic in common among the six successful TAGs was their emphasis on continuous direct assistance and involvement in their client sites. Finally, the FPSEC study found little to support the notion that provision of slack resources is, in itself, sufficient to generate

any substantial amount of sustained knowledge utilization and change. Indeed, the major construct advanced by this study to explain success--mutual adaptation--implies some interaction among knowledge providers and users. This is supported in Volume VII of the FPSEC study, when sustained utilization is associated with involvement of outside intermediaries.

It appears clear that personal involvement of intermediaries will help to secure broad-scale utilization of new educational knowledge and practice. Conversely, appropriate utilization occurs haphazardly in the absence of intermediaries to stimulate and guide it. Beyond this generalization, the evidence is less clear, although several propositions appear tenable. One regards the function this interpersonal involvement serves, another the level and timing of such involvement, and a third the technical nature of the interactions. Each of these is discussed below as a potential generalization in need of further study, clarification, and validation.

a. Direct personal intervention serves to initiate the utilization process, to link users to the most appropriate new knowledge and products, and to guide and reassure users at key points in the utilization process.

Although findings from the FPSEC study indicate that personal involvement of intermediaries from outside the school system may not be essential to initiate utilization processes, both the PSDP and the NDN studies show the powerful effects such early involvement can produce. Currently popular models of change continually point to perceived need as the motivating force behind information-seeking and utilization behaviors. A vital question is whether perceived need is currently resident in schools, or whether it results from change agent interventions. As Louis and Sieber's follow-up studies on the PSDP show, a large proportion of information seekers (over 50%) either made no use of, or merely absorbed the information, with no apparent utilization

consequences. When the data are examined in terms of areas served versus not served by field agents, a difference in utilization patterns emerges, with searches by field agent clients being nearly twice as likely to result in actual implementation of new practices. Since there is no a priori reason to believe that field agents' clients had more advanced needs assessment capability (in fact, Sieber et al. suggest the reverse is likely since agents' clients tended to occupy lower positions in district hierarchies), it is reasonable to attribute these utilization differences, at least in part, to field agent involvement. Similarly the most successful utilizations found in the NDN study occurred when there was extensive early on-site involvement of Facilitator change agents. Accounts of their activities show they served to clarify priorities, review alternatives, assess feasibility, negotiate commitments, and plan out subsequent utilization steps and activities.

Another consideration is school predisposition to change. The PSDP, FPSEC, and NDN studies suggest that school staff are not all that resistant to change. However, it appears some personalized guidance may be needed to help structure and direct local activities. Without this early personal assistance, subsequent utilization becomes uncertain. This certainly does not preclude locally initiated change. As the FPSEC study shows, at least some local schools are capable of identifying problems, securing resources, planning and implementing change--often representing state-of-the-art improvements. But the evidence suggests that the clear majority of schools, both public and nonpublic, will need help initiating and implementing the change process.

An interesting composite of important change agent characteristics is emerging. In both the PSDP and NDN studies, much of the value of the field agents and Facilitators is attributed to their status as outsiders (with no

vested interest in internal politics) and their roles as generalists (in the sense that they are not tied to a particular innovation or product). Also recognized as important by these studies were such attributes as the change agents' familiarity with school customs and norms (presumably based on their prior experience as teachers and/or administrators) and their legitimacy as representatives of higher-level authority or policy (as opposed to commercial or university interests, which school staff have come to view as exploitative or irrelevant). Exactly how these characteristics weigh in the effectiveness of the change agent is not yet well understood (and may not be knowable with much precision). Still, these characteristics, when combined with effective human relations skills, seem to render the change agent a trusted and influential element of the process. His/her suggestions and recommendations are taken seriously by the staff, and the effective agent is able to maintain a fine balance between providing useful guidance and feedback vs. creating a sense of dependency (which would be detrimental to local ownership and sustained utilization). The PSDP study is particularly instructive regarding the time and effort required to earn local trust and credibility. Field agents had to demonstrate their awareness of "unique" local conditions before they had any influence over staff utilizations. One plausible thesis is that the information seeking and knowledge utilization behavior evident in the PSDP study was initiated primarily from incentives created by the extension agents' social interactions with the local staff.

This thesis is supported by the other studies included in this synthesis. Both the NDN and TAG studies cite the charisma and enthusiastic leadership of the program advocate as the "force" or incentive source that initiates local involvement and creates pressure to participate. These interventionists are not "pied pipers"; they are capable individuals who are able to establish strong

sharing relationships with local staff. As with the PSDP intermediaries, they act to raise the consciousness of their clients and provide both role models and pressures to conform. They usually appeal initially to a limited subset of any given faculty, most often those who have an interest in professional development or in exploring alternatives.

Rather than altruism or vocational dedication, mutual self-interest seems to dominate the process. The interventionists expend energy and resources competing for clients, and often must focus on only a few of many opportunities. Similarly, local staff resist changing in any substantial way what they are already routinely doing. Change requires work, involves risks, and seldom offers clear and immediate advantages. Both the agent and the client must be satisfied that their interests are protected before the utilization process (be it use of a resource system or adoption of an open education curriculum) commences.

b. Direct intervention should be distributed over a considerable period of time (two or more years), with more frequent contacts during initial stages. Contacts should focus on key administrative and instructional opinion leaders (possibly including community representatives and board members)

All of the studies identify the early stages of change as critical and in need of coordinated assistance and guidance by skilled intermediaries. Also, all the studies indicate successful utilization and change seems to require several years, almost regardless of the nature of the innovation or new knowledge. There do seem to be exceptions, such as minor modifications of on-going programs, and changes involving no interdependencies among staff (e.g., a single teacher's adoption of a new text or revised instructional materials). But the present studies were generally concerned with effecting more substantial change, and found that such change takes time.

The most complex and lengthy changes were those that involved structural modifications of the educational system or revisions of curriculum scope and sequencing. In these cases, usually a large number of local staff were ultimately affected, and the critical task was coordinating and managing the process. Effective intermediaries in both TAG and NDN studies directed the majority of their early assistance efforts toward clarifying and coordinating role and responsiblity changes among staff; in providing extensive "over the shoulder" guidance; and in strengthening internal communication structures. The most popular strategy was to begin relatively small, with only those staff (both administrative and instructional) who were most interested in and capable of carrying out the utilization. As these staff became familiar and comfortable with the new practice or procedure, additional staff became involved.

Just as the complexity of a given change effort is determined almost totally by local factors (e.g., how different the new practice or procedure is relative to what staff are currently doing, how many staff will be affected, staff interdependence), so also seems to be the "right" number of staff to involve initially. The FPSEC study refers to the need for a "critical mass" of participating staff, which we interpret as a threshold concept. This critical mass would be the minimum number of local staff needed to render the utilization viable. Clearly this number would vary across innovations and across users of any given innovation. Again, we conclude that it is the skill and insight of the change agent which is needed to determine the optimum number of initial participants.

Most of the studies indicate the level and duration of direct assistance needed by the change agent is less when the process is initiated by users with clear change objectives and priorities. In these cases, the change agent often serves a broker/facilitator function, putting an already change-motivated

staff in contact with appropriate resources, and providing general support assistance as needed or requested. More typically, however, the studies show the school staff usually have only vague general change goals, unclear objectives, and a variety of competing internal and external demands.

Although these studies recognize the dangers of allowing clients to become overly dependent on external intermediaries, there is general agreement that most utilization/change processes require time to mature and stabilize and that intervention strategies must provide for follow-up assistance. The PSDP study concluded that most field agent clients needed some assistance in interpreting the information they received and in planning and carrying out actual changes (e.g., in their teaching practices) based on the information. In the NDN study it was found that follow-up from Developers and Facilitators during the implementation stage was essential; if the contact between the intermediaries and the users stopped with pre-implementation training, utilization was almost certain to falter or cease entirely. And the FPSEC study concluded that the change process requires careful guidance and management through all its stages. Even an apparently successfully initiated project may fail during implementation, and a successfully implemented project may not survive early withdrawal of external support.

c. On-site assistance invariably involves more than communicating the technical and procedural details regarding the use of new knowledge and practices.

Findings from the five synthesis studies are fairly consistent regarding this point. For one thing, the assistance appears far less "technical" in the sense of technology transfer or didactic procedures than conventional jargon implies. The training or skill development is nearly always accomplished by means of guided experience--a sort of learning by doing. The use of modeling and over the shoulder techniques is common. Pedantic methods of

knowledge transfer are occasionally involved, but workshops and demonstrations tend to emphasize conceptual, philosophical, and professional issues.

In reanalyzing the PSDP study, Louis (1977) identifies four constructs which she feels account for the effectiveness of the field agent: social distance, intensity of change agent involvement, expertise needed, and expertise provided. In essence, Louis argues that the on-site effectiveness of the PSDP intermediaries was more in terms of their human relations skills and organizational status than in their technical knowledge and expertise. Similarly, both the TAG and NDN studies describe the elaborate assistance campaigns needed to infuse change. Demonstration and training workshops and activities typically emphasized philosophical and educational rationale for utilization of new knowledge, products, or practices, with lesser emphasis on technical or mechanical details. The most effective intermediaries had articulated and codified the "essential elements" or "spirit" of their innovations. Utilization details were seen as natural extensions of the irreducible core of the innovations. Seldom did intermediaries impose inflexible "how to" specifications on users. Rather, they usually concentrated on conceptual issues designed to develop cognitive awareness and affective approval, and accepted, or even encouraged, local modifications that did not violate the essence of the innovation.

The importance of this cognitive orientation of effective change agents is indirectly supported by both the FPSEC and PIP studies. The vast majority of utilizations initiated by the federal seed money programs failed to accomplish meaningful change and/or tended to be discontinued after withdrawal of support funds. The dominant site characteristic accounting for this outcome is described as the local change orientation--opportunistic or problem solving.

We hypothesize that a primary function of the change specialist is to establish and focus this local change orientation.

Study after study shows that in the absence of this focusing/educative component the rate and extent of meaningful change is very poor, even for mandated programs of prescribed change that provide the resources needed (money and materials) directly to school systems. We feel the PIP study is most instructive regarding this issue. Virtually every step in the initiation, training, and implementation stages of the packaged projects was prescribed in detail for the school staff. The PIP model assumed that structural replication of an effective project in a new setting would render it similarly effective. The study found, however, that effectiveness seemed unrelated to structural replication--it was the interpersonal and instructional style of the staff that accounted for differences in effectiveness. Most likely, good staff will make any new project appear effective.

Finally, one of the strongest conclusions emerging from the FPSEC study regards the construct of "mutual adaptation." This construct posits that not only do users undergo change in the process of implementation of new knowledge or practices, but that the knowledge or practice is itself modified in the implementation process. This observation has several very important implications for planners and facilitators of change. First, it emphasizes the process nature of utilization; both the user and the innovation (or aspects of the knowledge) undergo modification in the utilization process. This generates <u>new</u> information relevant to the general application of the knowledge or innovation. This new information helps identify both the essential features of the original concept and the limits of its general applicability. Hence, the second implication of mutual adaptation is that a particular innovation, concept, or new idea may be differentially relevant and

applicable across users.* A third implication is that a given idea or product will continually evolve based on information developed in the implementation/utilization process. Attentive change agents will benefit from this source of information in revising and improving their dissemination and utilization support skills.

All of these considerations support the basic proposition that on-site activities of change agents involve far more than merely transmitting technical "how to" information. Whether the agent is a generalist or a specialist, he or she must accommodate a variety of personal and systemic concerns within the user community. The innovation must become consonant with local staff's personal and professional goals and values, needed adjustments in administrative and standard operating procedures must be integrated into the implementation, and coalitions in support of the utilization must be encouraged and cultivated. Sieber, in his recent publication (1978) has argued these "boundary spanning" functions of change agents may be more important than their knowledge or technology transfer functions. His arguments appear well supported by the evidence from these synthesis studies.

3. Continuous personal participation of the implementing staff is needed to firmly root and sustain the utilization.

The notion that schools operate tightly structured hierarchical organizations has been fairly well disconfirmed by a number of studies conducted over the last decade. Still we note with concern a disregard for this reality in state and federal policy regarding school improvement and reform. Of all public service institutions, schools most often appear as the targets of

* A corollary is that there are limits to adaptation beyond which the innovation or idea cannot survive in its essence.

centrally mandated reform. Yet even a casual organizational analysis of schools suggests a multitude of reasons why such reforms almost inevitably fail. First, schools are not active, but reactive. Schools operate as loosely coupled social bureaucracies. They are not striving, "success-oriented," continually improving, self-organizing systems. Their modus operandi is "status quo" unless externally imposed incentives and resources impinge on them.

In view of this bureaucratic inertia, how do we account for the apparent success of the change programs reviewed in this synthesis? The two generalizations already developed which seem to hold up across the studies are that (a) when some form of direct on-site intervention is employed, and (b) when the external intervention is keyed to both systemic and personal change processes, then utilization outcomes and change become much more likely. A third generalization also emerges across the studies: Active and continuous participation of implementation staff is essential across all stages of the utilization process.

The FPSEC, NDN, and TAG studies supply the most detailed evidence relevant to this generalization. Of the eight important components of successfully implemented change identified in the FPSEC study, six pertained to participation of the implementing staff (frequent staff meetings; extensive involvement in demonstration and training components, with continuous feedback; local development of instructional materials; decision involvement; involvement of a critical mass of participants; participation of highly motivated staff). Collectively these findings describe a situation in which local implementation staff are provided with responsibilities, flexibility, and support. The change strategy is planned and managed in a way that fosters development of commitment, ownership, and success. This,

in turn, provides a within-site basis for gradual expansion and incorporation of the change on a broader scale.

The need for local staff commitment and ownership is explicity recognized in the NDN. The use of "adoption agreements" and requirements for continuous participation of instructional staff characterized the more successful strategies identified in the NDN evaluation. Like the FPSEC study, the NDN study found initial concentration on highly motivated staff and frequent meetings of participants to be important predictors of implementation success. More importantly, findings from both studies suggest that early and continuous involvement of implementation personnel was very important. Failure to include potential users in initiation activities and key planning decisions was almost invariably associated with implementation failure or discontinuation of utilization efforts.

The TAG study also cites staff continuity from adoption to implementation stages as one of the fundamental requisites for effective change. Change agents were selective, usually choosing to work with a small number of enthusiastic, competent, and committed staff rather than an entire faculty. Also, assistance efforts were planned to provide fairly continuous direct interactions with these staff over fairly extended time periods (usually two or more years).

The strategies found to be successful in the FPSEC, NDN, and TAG studies can be contrasted with the familiar "top down" approach, which assumes that change can be imposed by administrative fiat. In the top-down approach, there is usually a marked discontinuity between the locus of initiation and the locus of implementation. Initiation decisions are made by district administrators, but implementation consequences are felt in the schools and classrooms. As will be shown below, we are not arguing against administrative

involvement in structuring the nature and direction of change (e.g., the "top-down" model). Rather, we are attempting to identify likely reasons why such efforts are particularly vulnerable to failure.

The PSDP and PIP findings indirectly support the importance of staff continuity. Field agents in the PSDP learned that a considerable amount of on-site interaction was usually needed before the intended information-seeking behavior emerged. Much of this time was spent cultivating interest and commitment among instructional staff (who are not typically users of ERIC and similar external information resources). The first version of the PIP materials was designed primarily for a "project director," who was expected to coordinate information and activities among the implementation staff. However, in the basis of the PIP field test evaluation, these materials were substantially revised such that each participant would have a more or less complete set of materials which described all important components of the project but differentiated and elaborated those components most relevant to the individual participant (teachers, aides, evaluators, and so on).

That the majority of "top-down" change programs usually, by definition, involve staff discontinuities may represent the primary source of their failure. The FPSEC study suggests that such top-down efforts succeed only if the implementing staff are predisposed to the change and are provided with resources, personal support, and professional incentives to carry out the implementation. In other words, the implementing staff must also, in some fashion, progress through an initiation stage in which they become aware of and interested in the change. As this process unfolds, use and commitment decisions are made and implementation commences, and new practices are

gradually assimilated. The vital point is that these decisions and commitments can only be made by the implementing staff. Change by fiat or decree is likely to be problematic.

We conclude, then, and all five studies concur, that a fundamental component of the change process involves the ultimate user's integration of goals with procedures. Several additional lines of research support this conclusion. Hall and his colleagues (Hall, Wallace, and Dossett, 1973) have developed a set of highly reliable scales which characterize the orderly progression of utilizing staff from non-use through internalization (or incorporation). Within this continuum, Hall et al. differentiate seven separate levels of use, each indexed by corresponding user concerns. Interestingly, the successive stages of user concern also correspond to stages of more complex goal-procedure integration. But more importantly, Hall and his colleagues point to decision events which occur at each Level of Use transition. These user decisions are apparently influenced both by the user's experience and by appropriate change agent interventions. This would imply that different intervention tactics will be differentially appropriate, depending on the client's use state.

Evidence from the NDN and TAG studies provides very strong support for the conclusion that effective assistance strategies recognize and interact with variations in the client's state of use. In both studies, the investigators interpret flexibility and adaptability as the dominant characteristic of successful assistance strategies. The Awareness-Training /Demonstration-Follow-up sequence is more chronological artifact than part of some rigid assistance schedule. The nature and focus of on-site activities followed a general plan, usually keyed to user events. The one characteristic that

effective activities had in common was targeting--active participation of implementing staff was often required and always solicited.

It is apparent from the studies that a number of variables--some endogenous, some exogenous--affect the decision/commitment process of implementing staff. At present, we are not aware of any single strong theory of change adequate to guide the identification and ordering of variables for purposes of understanding and predicting this process. Some evidence suggests commitment emerges on the basis of experience, whereas other evidence indicates commitment is a prerequisite of meaningful experience. Still, it does seem clear that user commitment and implementation success are most often found in areas where user staff have been active participants throughout the utilization/change process.

4. Administrators occupy a crucial role in supporting the utilization process.

The previous generalization regarding the importance of staff continuity from initiation through later stages of the utilization process may have appeared to imply that administrative involvement and support are unimportant. Quite the reverse is true. All of the studies in this synthesis point to the crucial role administrators play in setting change priorities, establishing incentives and conditions conducive to utilization, and providing leadership and support throughout the process. For example, a key conclusion of the PSDP study is that the agents' status as generalists and outsiders, lacking authority to mandate change, enabled them to operate as boundary spanners, removing organizational and administrative obstacles to change. The agents did not try to preempt local leadership and authority, but instead mediated staff and administrative needs and interests and assisted in the formulation

of coalitions. The study concluded that the agents' informal use of extant power structures was a major component of their effectiveness.

The FPSEC study points with even greater clarity to the central role of administrative leadership and support in creating a "problem-solving" orientation to change among staff and in managing the change process throughout all its stages. The study concludes that this orientation depends on unambiguous commitment and support by local administrative leaders. Given that most change efforts are focused at the school site level, the building principal occupies an especially influential role in establishing change orientation, creating incentives for participation, and supporting implementation efforts by the staff.

Findings from the NDN study are consistent with this generalization, even though they indicate active leadership from administrative personnel may not always be required for success. Specifically, when administrators were actively involved in all stages of the utilization process, implementation tended to be more complete and well-rooted. However, a large number of successful utilizations were found in contexts where administrative involvement was relatively passive. In these instances, active leadership was centered among one or more enthusiastic (and highly competent) staff, quite often a specialist from the central office. Still, utilization rarely occurred when building or district administrative components were indifferent, and utilization was virtually impossible in the presence of administrative opposition.

Acknowledgment of the importance of securing administrative concurrence and support is seen in the diffusion strategies of the more successful NDN Facilitators and Developers. These change agents required that representatives of both instructional and administrative staff be present at awareness

demonstrations, visits to demonstration sites, and training activities. Part of the conventional wisdom of the NDN was that successful adoptions required active commitments from both staff categories. War stories about problems encountered due to lack of sufficient administrative support (usually due to change agents' oversights or miscommunications) were frequently exchanged.

The findings from TAG and PIP experiences are essentially consistent with the notion that administrative support is necessary, and suggest a corollary: implementing staff must perceive and share administrative interest in the utilization. This is basically an extension of the staff continuity generalization. If the utilizing staff do not recognize and share in the interest, knowledge, and support of the local leader, utilization will be problematic. This phenomenon seems to follow organizational lines. If the local administrative authority (central office or building) remains neutral, utilization will then depend on the emergence of a local leader acceptable to both staff and administration to initiate and manage the process. Similarly, if the utilization is to be focused at the administrative level, perceived support at higher levels seems to be a requirement. The generalization seems to reduce to the following: Utilization occurs when the involved staff perceive such utilization to be in their interest and in the interest of relevant leadership and authority figures (significant others in their environment).

These synthesis studies indicate a variety of tactics are available for cultivating administrative support. The most effective appear to be those which involve in-person participation of change agents. Even so, this support emerges only gradually, often requiring many months. The PSDP study indicates the better part of a year was required before administrators and staff became committed to "trying out" the information. The PIP study shows utilization occurs only gradually, with full implementation occurring generally by the second year of effort.

Most NDN "adoptions" did not occur until many months after staff had become aware of the innovations' availability and use requirements, and the TAG study reports that three years are usually required before implementation becomes fully operational.

An issue usually considered especially relevant to administrative support is the relative need for and availability of slack resources to utilize some innovation. School systems characteristically do not boast of having slack resources. Yet these studies and others show the availability of funds is not a prime determinant of utilization. Once the staff becomes truly committed to adopting some change, the necessary resources usually are mustered, most likely through political processes which govern local expenditures.

5. Material resources at the "how to" level are needed, particularly for utilizations involving organizational or instructional changes.

The issue of material resources is among the more controversial of those frequently debated in the field of educational dissemination and change. Part of the controversy seems to rest in the ambiguity of the term "materials," part in disputes over the objectives of dissemination efforts, and part in reaction to (or disenchantment with) the push for educational technology and teacher-proof materials of the last decade.

The general term "materials" is commonly used to describe at least three different categories. We will refer to these three categories as information resources: descriptive, instructional, and support materials. Descriptive materials include printed matter, visual displays, and other forms of information designed to communicate what the new knowledge, product, or practice is and how it can be used. The Project Information Packages (both the ASK and the PIP components) represent examples of these descriptive materials. Awareness brochures, training packages, and various "how to" modules would thus

fall into the category of descriptive materials. Some level of descriptive materials seems to be a necessary, but not sufficient, requisite to utilization. In other words, the provision of descriptive materials does not by itself usually produce intended utilizations, although there is some evidence that descriptive materials alone may be sufficient to initiate utilization efforts. It seems that some descriptive materials are necessary to support the utilization process; however, efforts to produce change solely through in-person methods have had limited and uncertain consequences.

Although we are still uncertain of the precise role of these descriptive materials in the utilization process, evidence across the five studies suggests that descriptive materials function more as stimuli and general guides than as scripts for behavior. At one extreme, the PIP study shows that, given the appropriate incentives and conditions, staff will attempt to make literal use of descriptive materials. At the other extreme, the PSDP and FPSEC studies show that, other things being equal, descriptive materials play a relatively minor role in shaping many important details of utilization.

Both the NDN and TAG findings suggest to us that one important function of descriptive materials is that of clarifying and reinforcing the central concept underlying the innovation or practice. In both these studies, direct intervention by change agents and advocates mobilized user interests and initiated utilization behavior, particularly among staff whose educational philosophy or change priorities were compatible with the change agent's. This compatibility of goals and philosophy was not produced by materials; either it was one of the change agent/user matching criteria, or it resulted from selective brokering and change agent persuasiveness. Still, awareness-level descriptive materials often surfaced candidate users, and hence were seen as an important part of the matching process.

Both studies investigated procedures--in-person tactics and use of materials--used by change agents to advocate particular programs and philosophies of education. Although the unique versus joint influence of these two tactical procedures is certainly not yet clear, evidence suggests that in-person tactics operate primarily to stimulate staff motivation to change (or engage in efforts to utilize), and only secondarily to communicate technical details of the new idea, product, or practice. Materials, in various forms and levels of detail, communicate the technical details and serve as references which the utilizing staff use according to their personal styles and information needs. But the overlap between interpersonal and material influences on user behavior seems enormous, and the technical nature of this overlap is complex and certainly not as yet well understood.

The above discussion dealt with findings regarding the importance of descriptive materials in change programs. The second category of materials is defined as instructional--those workbooks, texts, audiovisual sequences, and other central elements of the curriculum which make up the content of education. Whereas descriptive materials pertain to the nature of the innovation or new knowledge, requirements for its use, its value or relative advantage, etc., instructional materials constitute the subject matter of education--the workbooks, lesson plans, games, study units, tests, etc., which make up the "what" of curriculum and instruction. As is shown later, the evidence is mixed regarding the need for and effects of provision of such instructional materials in dissemination utilization programs.

The third category of materials is made up of various technological and audio/visual/tactile components which are adjunct to and occupy a background or support role in the utilization. By definition, such materials are neither central to the innovation nor essential to the utilization process. Note that

if the innovation were centered on use of such materials or resources, they would not be classified as "support," but rather would be defined as "instructional" materials. Because support materials and resources are easily and often confused with instructional materials, evidence regarding their importance to effective utilization is very difficult to interpret. To a great extent, this confusion is tied to limitations in current state-of-the-knowledge regarding effective educational practices and requirements.

The most extensive and sophisticated study of the role of support materials in change efforts is found in the PIP tryout evaluation. Besides providing elaborate and detailed descriptive materials on project management, start-up, pupil selection, staffing, and operations, the PIPs also specified a wide array of support hardware and software, yet the tryout study showed that even with this elaborate materials specification, characteristics of project implementation varied widely within and across replicating sites. More importantly, however, the study found that staff commitment and project effectiveness (pupil growth) were independent of structural replication of the PIP specifications. Only for one project type--involving cross-age tutoring--did designated use of support materials appear to relate to project effectiveness. But the complexity of this "well-implemented" project was considered modest, both relative to the other PIPs and to any changes required of the current instructional staff.

The more telling consequence of the PIP study is in the nature of materials revisions based on tryout findings. In revising the PIPs, much more emphasis was placed on descriptive materials (focusing on the "how" and "why," and de-emphasizing the routine "whats" and "whens") of project operations. Also, efforts were made to shift what in the initial version were "support/resource materials" (by our classification) to more fully differentiated descriptive

and instructional materials. Findings from further studies of these revised PIPs should be available shortly. Based on the FPSEC, NDN, and TAG findings, we predict that these revisions will render the PIPs more useful to utilizing staff, even though evidence of "replication" will likely diminish (more adaptation is likely).

We recognize that many may quarrel with these three materials categorizations and it is not our intention to exclude alternative classifications. Rather, our purpose is to introduce a means of sorting out the various types and potential roles of materials involved in dissemination and utilization efforts so that their necessity and effects can be better understood. Currently, we are limited to nonspecific generalizations about the need for some descriptive "hard copy" materials to support dissemination activities and to provide referents for utilization efforts. Also, because utilization seems so highly dependent on psychological commitment and ownership by utilizing staff, we conclude that over-developed instructional materials which might reduce or minimize active staff involvement may be detrimental to the utilization process. For example, a very important finding developed by the FPSEC study and supported by most of the other studies is that resource provisions, such as large grants, curriculum kits, and exotic hardware, may be irrelevant (if not distracting) to the development of <u>appropriate</u> administrative and staff commitment. This phenomenon needs to be further investigated to be properly understood. Still, we feel it is logically consistent with the major synthesis generalizations. For one thing, resources usually are not expected to effect improvements in and of themselves. Rather, it is the <u>use</u> of resources that constitutes the intended change and which effects improvements. Resources that require little or no active participation of current staff, or that actually diminish the roles of current staff, would not be likely to generate much utilization

commitment unless their effects were extraordinary. Hence, it is understandable why "teacher-proof" curriculum kits are not favored by teachers, why add-on self-contained compensatory or enrichment programs seem to depend on grant support for continuation, or why expensive technological gadgets purchased with grant funds usually end up collecting dust in equipment closets.

Finally, we are less convinced of the role and necessity of support materials since, by definition, they are adjunct to the utilization. It is clear to us that the materials issue needs further detailed investigation. More specifically, most studies to-date have concentrated on variations in the nature, content, and deployment tactics of descriptive materials. We have seen that such materials are most relevant to initiation of utilization processes. We are less well-informed on the specifics of instructional and support materials and how these interact with various in-person assistance tactics in influencing later stages of utilization, particularly with respect to different change goals and utilization contexts.

6. Further considerations.

Beyond the generalizations discussed above, findings across the five synthesis studies appear relevant to a number of further issues in dissemination and change. These are briefly reviewed and discussed as they may relate to further understanding of the dissemination-utilization process.

a. Comparison of models.

Three general models of utilization assistance or linkage are represented in this collection of studies: direct intervention, based on the extension agent model; capacity building,* based on the seed money model; and networking

* The term capacity building is used in its generic sense; namely, to enhance the development of local skills, capabilities, use of resources, etc. which

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(or brokering), based on the configurational model. The PSDP, PIP, and TAG studies represent versions of the direct intervention model, in that the sponsoring agency or group designs its materials and activities to directly intervene in target schools to produce utilization and change. The intervention medium in the PSDP study was extension agents, whereas for PIPs it was the packaged materials (coupled with the utilization grants). In the case of TAGs, the dominant strategy is clearly direct intervention, although elements of other strategies are involved.

At the other extreme, the FPSEC study is an example of a capacity building approach. Seed money grants were intended to "unfreeze" the school systems, constituting slack resources or "capacity" for staff to develop their own innovations or make use of those produced through educational R&D programs.

The networking approach based on the configurational model is most closely approximated by the NDN. Here, direct assistance activities are brokered to local schools by the regional facilitator. This facilitator is not an extension agent for a particular innovation, although, like PSDP agents, s/he may also engage in direct assistance and linkage activities in local sites.

The distinctions drawn above are primarily in terms of the major design emphasis of the change approach. A great deal of overlap exists among these programs at the operational level so that our classification scheme should not be taken too seriously. Still, we note that outcomes are consistent with design features of the general approach. This has important implications for

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are expected to result in sustained program improvements and in the emergence of renewal capabilities. This usage should not be confused with NIE's State Capacity Building Program, which is oriented more toward the development of capacity in the SEA to help schools and school districts to solve their problems.

those involved in the planning and implementation of change programs. Direct assistance approaches based on extension agent models offer a great deal of control over the change process, but at considerable expense for large-scale efforts. The network approach seems to offer a means of effecting fairly wide-scale utilization and change at relatively low costs, but most of the control over the process available with direct intervention is lost. The capacity building or seed money approaches represent high risk-high profit tradeoffs; most local improvement efforts will not succeed, but those which do will become available for wide-scale dissemination through other approaches (e.g., direct assistance or networking). Thus, we conclude that the search for an effective educational change approach is not an either/or proposition. Rather, once the change mission is clearly defined and understood, relative tradeoffs such as those described above can be evaluated in the design or selection of the most appropriate approach.

b. Ripple effects.

Another issue raised across the five studies has to do with secondary spread of utilization within and across users. This concept has been referred to as a ripple effect and its occurrence was investigated in three studies. Specifically, the PSDP study reports occurrence of extensive "ripple effects" among client staff. These were documented as general increases in instances of information-seeking behavior among staff at sites served by field agents. On the other hand, the TAG study asserts "ripple effects" do not generally occur within or across sites. Investigators note that organizational, as well as socio-political, factors within school environments impede or prevent such internal spread. The NDN findings appear more in line with TAG than PSDP, although users report they actively "promote" the spread of their adopted innovations.

Part of this apparent discrepancy in findings appears to be in the definition of "ripple effects," and the state of the utilization process at which their occurrence is documented. Accordingly, findings are relatively inconsistent, showing ripple effects do tend to occur at initiation stages, but are less pronounced at implementation stages. This corresponds with earlier generalizations regarding the dependence of implementations on external assistance of some form. Ideas seem to diffuse with relative ease, but corresponding use does not necessarily follow.

c. Knowledge-use relationships.

A direct implication of this conclusion is that knowledge is probably not a sufficient condition for use. Evidence from the five studies suggests that dissemination systems designed around the notion that schools behave as rational, information-seeking consumers will have a very limited success. Rather, these studies have greatly contributed to an understanding of complex local conditions which act to inhibit such utilizations. School systems have been shown to be complex, loosely-coupled institutions with multiple unclear goals. They are subject to the same bureaucratic inflexibilities and constraints as are other public service institutions.

Moreover, school systems differ enormously in character and organizational complexity both within (elementary versus secondary) and between (urban versus rural) themselves. Countervailing trends coexist (decentralized versus centralized decision-making and governance; expanded curriculum versus return to basics, etc), and authority alliances are ambiguous and diffuse (teacher organizations compete with administrative authority for control over teachers). Teachers are insulated from any direct external intervention by virtue of the institutional structure of their schools; hence it is very difficult for those outside the institution (including parents) and even for many within the insti-

institution, particularly above the level of department head or building principal, to control classroom practices. In a sense, schools present an enigma--they are very difficult to change toward specific ends, particularly from the outside--yet, as we noted earlier, they do appear amenable to improvement-oriented change seen as consistent with perceived needs and priorities. The logical inference, then, is that the linker or change agent serves first and foremost to stimulate or clarify locally perceived needs and priorities, and to direct staff attention to available information, products, and resources relevant to these local needs and priorities. Because these activities involve complex interpersonal transactions, it follows that human relations skills will become of major importance.

d. Change agent skills.

Several implications for the development of effective change agents (linkers, intermediaries, brokers, technical assistants, facilitators, etc.) can be derived from the synthesis studies. First, at least two major categories of skills seem to be involved: human relations and technical knowledge. Second, the available evidence suggests that the development of these capabilities is accomplished more through staff selection, experience, and socialization processes than through formal staff training procedures. Third, the development and refinement of these effective change agent skills requires a great deal of time, often many years.

Given these observations, it is questionable whether one could specify with any precision, let alone implement, an effective general program or set of procedures for training linkers or change agents. We suspect that as dissemination efforts gain in experience and legitimacy, these training dynamics will become better understood.

e. Criterion problems.

Related to the issue of "ripple effects" are several problems associated with what constitutes utilization. One such problem pertains to the inherent contradictions between adaptation versus the integrity of the knowledge--what limits can or should be imposed on the adaptation process? At what point does adaptation nullify utilization? Other problems include: What standards or restrictions, if any, should be imposed on the collection of ideas, products, or practices being disseminated? How can such intangibles as the quality and complexity of change be documented and evaluated? Although these issues have no simple resolution, they have been brought into focus through recent studies such as those in this synthesis, and have served to underscore the true complexity of the change process. The fact that this synthesis was supported indicates tacit recognition by the NIE that educational dissemination and change is a complex, but not inscrutable, phenomenon. Progress in developing a fuller understanding will be slow and difficult. We can only hope that this synthesis will serve such ends.

7. Guidelines for an effective dissemination/utilization program.

In addition to the general issues discussed above, our review of the five studies has identified a number of components that, we conclude, characterize successful approaches to dissemination and change. These components appear to lead to (or increase the quality of) intended consequences of the programs. Some of these components are better understood or have been more carefully investigated than others. Accordingly, many of the "recommendations" for dissemination programs offered below are propositions for further investigations.

To be maximally effective, a dissemination strategy would:

a. Identify and gain access to clients by means of the personal referral networks and informal communication channels existing within the client social

system. Although formal dissemination systems (ranging from "top-down" campaigns to direct mail, broad outreach tactics) will produce some impacts, they will be spotty and unsystematic and will include a large proportion of false starts. By contrast, the personal referral systems and social networks will provide low-energy access to targets with a much higher rate of intended consequences.

b. Use in-person (preferably face-to-face) communications, with accompanying "hard copy" materials. Both telephone and face-to-face contacts produce much stronger consequences than any other approach. Combining an in-person approach with use of the client referral network will produce an exceptionally high response to the dissemination efforts, and will have the most predictable and controllable consequences in terms of subsequent utilization.

c. Attend to and differentiate the organizational/bureaucratic nature of the client (school) systems. Schools are complex, loosely-coupled institutions with few incentives to change. The nature of useful information and assistance will vary considerably from one level in the organizational structure to another.

d. Target the primary level of entry at the organizational level most proximate to the intended locus of impact. Information and assistance intended for teachers should be targeted to teachers--not administrators--and vice versa. Teacher organizations as a point of entry and channel of contact have been generally underutilized.

e. Provide for and secure *prior informed concurrence* of all administrative levels *above* the level of primary interface. Informed concurrence often requires only a brief conversation with central-, intermediate-, and state-level administrative officers. If no action or resource provisions on their part are

required, and if they stand to benefit (even remotely), concurrence will be easy to obtain. However, if prior concurrence is not obtained, chances for utilization at the target level are remote.

f. Make use of change agents, interventionists, linkers, facilitators, intermediaries, assistance groups, advocates (or whatever their title!) who are most homophilous with the target subculture. Basically, the intermediary must be both familiar and compatible with the norms, values, conventions, and social characteristics of the client subculture. Parents work best in effecting parent involvement; teachers identify best with other teachers or with those with extensive teaching experience; administrators relate to administrators, etc. It is next to impossible to "fake" homophily. Client attributes, awareness, and sensitivity must be genuine.

g. Ensure that all transactions between the intermediary and the client are coherent and coordinated with the general goals of the dissemination program. The assumption that the target clientele understand problems and shortcomings of a dissemination effort is both false and disastrous in its consequences. The intermediary is an alien to the target social system. It is crucial that the intermediary group have its "act" together, and that all transactions are well-coordinated across individual agents. The single most damaging error an intermediary can make is to fail to deliver or meet a commitment (follow-up contact, delivery, or whatever). Also, all transactions should be fully coordinated with the relevant administrative levels--both in the target organization and in the intermediary organization.

h. Provide opportunities for choice in the content and style of target group involvement. To the extent that clients are offered choices, they will make decisions and thereby increase their level of participation and involvement. The intermediary must be prepared for rejection by one or more target clients.

i. Focus on a limited number of clients, at least 25 percent fewer than can be "comfortably" accommodated at any one time. Overcommitment of intermediaries (or an overly ambitious dissemination program) is a common and serious strategic error. By intentionally "undershooting," the intensity of transactions will increase and the incidence of problems (which spread by word of mouth faster than do successes) will be under more direct control of the intermediary. Maximizing the ratio of successes to involvements will enhance the legitimacy of the effort. Firmly rooting the utilization will generate an advocate of the system--the well-served client.

j. Place early emphasis on the philosophy and ideology of the information, products, or services being disseminated. To the extent that the consciousness of the clients can be raised and the professional and personal advantages identified, a sense of enthusiasm and motivation will emerge among clients.

k. Make early use of concrete experiences, assignments, materials, and utilization-relevant activities. Initial client involvement activities are crucial. Clients will expect directions and expertise from the intermediary. Continued transactions will depend primarily on impressions and level of activity during the initial encounter. Doing something is essential.

l. Provide repeated in-person transactions with the client staff. One-shot or "hit-and-run" transactions will not produce sustained utilization. A distributed program of transactions graduated in terms of the type of utilization involved will be required. The extent and magnitude of this program will, of course, vary in terms of the dissemination program goals.

m. Anticipate that utilizations involving some form of implementation process will be gradual and cumulative. Nearly all studies show that two or more years are required before any new practice or procedure stabilizes. The

first year is usually a period of becoming familiar with the mechanics--the "what, when, and how." Subsequent years involve internalization, accommodation, refinement, and further diffusion. The process is slow and requires rather continuous attention and support at the early stages. As the local staff gain experience with new procedures, external support can be withdrawn gradually.

IV. SUMMARY

In this report we have briefly described five important studies of programs designed to facilitate the dissemination and utilization of educational improvements. Each of these studies examined somewhat different programs or approaches to promote school improvement. Because these studies focused on the processes of dissemination and utilization (contrary to more typical evaluations of large-scale improvement efforts), findings show each program attained some measure of success, leading us to conclude that large-scale directed change is a reasonable and attainable goal.

The Sieber et al. study of the PSDP shows that school staff can and will make use of external sources of knowledge and information and that they perceive such use as leading to improvements in educational practice. The study of Federal Programs Supporting Educational Change (Rand) shows that seed money programs do occasionally stimulate major program improvement, but that the process is complex, costly, and by no means certain. The SRI/RMC study of the PIP field test shows that school personnel can in fact create operational replications of effective educational projects on the basis of descriptive materials alone, but, more importantly, that structural replication will not necessarily render the new project effective. The NDN study shows the enormous power a network of innovation developers and regional facilitators can have in stimulating and effecting wide-scale adoption and implementation of changes. Finally, the TAG study shows that irrespective of different change goals a number of basic properties characterize successful change agent operations.

Analysis of the findings across these five studies suggests a number of generalizations regarding the nature of the dissemination-utilization process as it affects improvement-oriented change in schools.

First, utilization must be approached as a process, not an event. The process appears to occur at two levels: individual and systemic. Effective dissemination approaches attend to both levels.

Second, some form of in-person intervention appears to be of major importance in initiating and guiding utilization processes, and may be a necessary condition for directed change. It appears that direct personal intervention serves to initiate the utilization process, to link users to the most appropriate new knowledge and products, and to guide and reassure users at key points in the utilization process. Such direct intervention should be distributed over a considerable period of time, often two or more years, with more frequent contacts during the initial stages. These contacts should focus on the key administrative and instructional opinion leaders who are to be most directly involved in utilization activities. Moreover, such on-site assistance will invariably involve more than communicating the technical and procedural details regarding use of new knowledge and practices.

Third, continuity of participation by utilizing staff throughout the utilization process is essential. It is not sufficient for a program change to be adopted by one group and implemented by a second; rather, the available evidence suggests that the implementing staff must also, in some fashion, progress through an initiation stage in which they become aware of and interested in the change. As this process unfolds, use and commitment decisions are made, implementation commences, adaptations and refinements occur, and eventual assimilation becomes possible. The vital point is that these decisions and commitments can only be made by the implementing staff.

Fourth, administrators occupy a crucial role in establishing change orientation, in creating incentives for participation, and in supporting implementation efforts by appropriate staff. For most school-level change, the building principal is key, yet higher levels of support are generally needed as well. Overall, utilization occurs most effectively when involved staff perceive such utilization to be in their own interests as well as in the interests of relevant leadership and authority figures. Utilization does not tend to occur in the presence of administrative opposition.

Finally, materials resources at a "how to" level appear necessary, particularly for utilizations involving organizational or instructional change. When dissemination materials are sorted into three categories--Descriptive, Instructional, and Support--some of the apparent conflict over the importance of materials can be reconciled. Descriptive materials seem to be essential; instructional materials (viz., "programmed instruction") can be detrimental; support materials are usually adjunct and are often beneficial at later stages of utilization.

Some further considerations lead us to question the notion of any single "best" dissemination approach; the likelihood of any substantial "ripple effects" in the short term; the validity of an implied knowledge use relationship; the current level of understanding of training requirements for change agents; and our current ability to quantify a great many of the qualitative issues in knowledge dissemination and utilization. Nonetheless, we feel it is now more possible than ever to prepare guidelines that should maximize the effectiveness of programs promoting dissemination and utilization of knowledge.

GLOSSARY

Adoption: informed and explicit action taken to undertake some previously unused program or practice with an expressed intention to continue such utilization.

Assimilation: the third major stage in the change process, in which the new practices, behaviors, and knowledge are fully internalized within the target unit.

Awareness: knowledge on the part of a potential user or target of the existence of a program, product, or practice; recognition of the possibility and potential benefit of change.

Campaign: a coordinated series of activities intended to accomplish a specific objective (e.g., to publicize services, to build support among teachers for a new program).

Capacity building: a strategy for promoting improvement-oriented change that attempts to enhance the target systems' internal capabilities to detect and diagnose weaknesses or problem areas, to identify potential solutions, and to select and implement the most appropriate solutions; advocates of this approach argue that it promotes development of sustained internal mechanisms for self-renewal.

Change agent: a critical stimulus for the planning and implementation of improvement-oriented change; usually used to describe a person who assumes a major role in change efforts (either within an institution of which he/she is a member or within another institution with which he/she interacts), but also used to refer to some other force for change (e.g., the Rand Study of Federal Programs Supporting Educational Change examined the use of seed money as a change agent).

Concurrence: agreement or support for a decision or action.

Critical mass: the minimum number of participants needed for an effort to succeed.

Demonstration: a display or representation of a product, practice, or project intended to highlight its key features or techniques and to interest potential users.

Demonstration site: a location which potential users can visit to see the knowledge (product, practice, or project) in operation and talk with current users; especially, a school or school system with experienced users and some provisions for accommodating visitors interested in the knowledge (product, practice, or project) being demonstrated.

Developer: the knowledge originator or inventor of a new project, practice, or project; a National Diffusion Network change agent associated with an innovation validated by the Education Division's Joint Dissemination Review Panel and funded to provide materials, demonstrations, training, and other assistance to personnel from other school systems interested in the innovation.

Diffusion: the spread of new programs, practices, products, or knowledge beyond the initial users, whether intended by the originator or not.

Direct intervention. a strategy for dissemination/utilization of new products, practices, ideas, and/or knowledge in which the information providers (individuals or sponsoring agencies) interface directly with the target system, using various tactics (usually on person-to-person bases) to bring about knowledge utilizations and change.

Dissemination: the spread or sharing of information, materials, knowledge, or ideas, possibly (but not necessarily) with the intent of changing the behaviors or beliefs of recipients. Four stages of dissemination activities have been identified by the Dissemination Analysis Group:

Spread: the one-way casting out of knowledge in all its forms: information, products, ideas, and materials, "as though sowing seeds."

Exchange: the two-way or multi-way flow of information, products, ideas, and materials as to needs, problems, and potential solutions.

Choice: the facilitation of rational consideration and selection among those ideas, materials, outcomes of research and development, effective educational practices, and other knowledge that can be used for the improvement of education.

Implementation: the facilitation of adoption, installation, and the ongoing utilization of improvements.

Educational change: the utilization of new practices or procedures resulting either from the innovative process or from the dissemination of new knowledge.

Essential features: those core or irreducible elements that are both necessary and sufficient to a given program or innovation; these elements set the innovation apart from others and must be present in any valid utilization.

Extension agent: (originally) a person employed by the Department of Agriculture to inform farmers of new products and methods developed in research programs and to train them in the use of the new products and methods; educational extension agents (also called field agents) are persons who contact personnel in state, intermediate, and local education agencies to stimulate awareness, interest, and utilization of information, technical assistance, and other resources.

Facilitator: a linker or intermediary who supports the utilization/change process; a change agent in the National Diffusion Network who is associated with a specific geographic region and provides a link between the Developers (with their innovations) and school systems in that region.

Generalist: an intermediary or change agent who is not associated with a single product or contact area, but instead has access to and provides resources (information, assistance, specialized personnel) for a variety of

innovations or content areas; examples include the Pilot Dissemination Program's field agents and National Diffusion Network's facilitators.

Intermediary: an interventionist or agent who attempts to facilitate utilization and change processes in one or more systems of which he/she is not a formal member.

Impact: a consequence of the introduction of a new program or practice into an existing set of conditions.

Implementation: the second major stage in the change process, in which attempts are made to utilize new knowledge and to effect actual changes in behaviors and practices.

Improvement-oriented change: a modification of the existing organizational structure, curriculum, instructional practices, etc., undertaken with the ultimate intent of enhancing educational productivity.

Incentive: a positive stimulus for action; an indicator that a particular course of action will result in some desired or valued consequence.

Incorporation: a formal codification or explicit policy statement regarding an adopted program or practice such that the program or practice becomes accepted operating procedure within the adopting unit.

Information: knowledge and ideas that are communicated through personal, print, or other channels.

Initiation: the first major stage in the utilization process. In this stage, users become (or are made) aware of some new knowledge, product or practice and begin to explore personal and systemic implications of its use, usually by seeking additional information and/or preparing to undertake trial implementations.

Innovation: the process by which new knowledge, programs, products, and practices are developed; also a new program, product, or practice developed through such a process.

Institutionalization: assignment of institutional status to a program or practice (both institutionalization and incorporation entail official endorsement; however, something that is institutionalized retains a separate organizational identity).

Linker: a person or agent whose job it is to connect disparate individuals, groups, or institutions; especially an agent who connects local, intermediate, and state education agencies to information systems, specialists, and other resources.

Materials: brochures, manuals, workbooks, handbooks, filmstrips, videotapes, and other hard-copy or mediated presentations of information. Three different types of materials are used in dissemination/utilization efforts:

> Descriptive materials: printed matter, visual displays, and other hard-copy information designed to communicate what the new knowledge, product, or practice is, how it can be used, and what benefits will accrue from use.
>
> Instructional materials: the textbooks, workbooks, audiovisual sequences, and other items which make up the basic curriculum or content of the educational process (curriculum materials that are not central to the innovation are classified as support materials).
>
> Support materials: printed matter, audiovisual aids, and other informational components that occupy a background or optional status; support materials include elements of an innovation's curriculum, management, and implementation that are neither central to the innovation nor essential to its utilization.

Mutual Adaptation: a dynamic interplay between the provider, the user, and the knowledge or products which results in modifications in the products being provided to current and future users and in the user systems that receive the products; (originally used by Rand) a process by which both the target system and the program or innovation change over time to become more compatible with each other.

Networking: a technique for affecting the flow of information and degree of interaction among knowledge providers and users through establishing multiple linkages at system and individual levels. In a complete network, each element

has direct access to all other elements. Partial networks can be structured vertically (e.g., following organizational lines) as well as horizontally (within levels of hierarchies).

Organizational dispersion: geographic separation of the members of a group or organization; an example is the three state projects in the Pilot State Dissemination Program, in which the management and information personnel were centrally located, while field agents were based in the districts or regions they served.

Organizational interface: a linkage or communication channel connecting two or more organizations or units.

Outcome: a measured consequence which is assumed to be the result of some identified cause; outcomes are the physical evidence of impacts.

Ownership: a sense of identification with, commitment to, and pride in a product, practice, or project among its users and other members of systems in which it is utilized or implemented.

Package: a compilation of materials (e.g. brochures, handbooks, filmstrips) that are associated with a common innovation or topic and that are intended to be distributed and/or used in combination with each other; the various materials may be designed for use at different times or by different persons or they may represent alternative approaches to a common issue.

Redundancy: use of multiple messages and contacts with a target, usually for the purpose of maximizing the likelihood of the desired response; repeated messages may be communicated to a single recipient, or messages may be communicated to multiple recipients within a single target system.

Resource: anything needed, available, or currently being used (e.g., money, personnel, time, facilities, equipments, and materials).

Replication: duplication of the structural elements of a program or practice

(e.g., pupil/teacher ratio, amount of time and subject areas of instruction, grouping patterns), intended to produce duplication of results or program effects.

Ripple effect: the spread of new information, ideas, and practices beyond the primary targets of a dissemination/change effort to other members of the same or neighboring systems without additional intervention from outside the target system; secondary diffusion that occurs more-or-less naturally.

Sanction: a controlling mechanism the primary purpose of which is to guide behavior through provision of rewards and punishments.

Seed money: funds intended to stimulate desired activities that would not likely occur otherwise; these activities are generally expected to "take root," resulting both in improved outcomes and in the receiver's intent to nurture and support the improvements over the long term.

Segmentation: division of a target audience into subgroups (based on institutional affiliation, job title, etc.) with different methods and/or messages specifically targeted to particular subgroups.

Slack resources: funds in excess of monies required to meet standard operating expenses and current obligations that (presumably) can be applied to other purposes; the federal seed money grants were intended to provide slack resources that school districts could use for new programs in targeted areas.

Specialist: an intermediary or change agent associated with a particular innovation, skill, or content area (e.g., a Developer in the National Diffusion Network).

Strategy: a collection of the organization, priorities, and sequencing of tactics constituting a system for goal attainment.

Tactic: an activity or procedure intended to accomplish an objective.

Technical assistance: information mediated by one or more persons (as distinguished from information supplied solely through print media and other materials).

Technical support: provision of resources (funds, information, personal assistance) from outside a target system for the purpose of facilitating improvement-oriented change within that system.

Transaction: an exchange between people.

Utilization: the manifest implementation or use of practices, procedures, or knowledge (as distinguished from knowledge awareness or absorption).

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